

T H E
Purchasers Pattern,
Much Enlarged.

The First Part.

Shewing the true value of Land or Houses, by Lease, or otherwise.

Whereunto is added many Rules for the valuing of the ruined Foundations in the City of London, and for the composing of Differences between Landlord and Tenant about rebuilding them: also Rules and Tables for the valuing of all Party-Walls.

Also Tables of Interest and Rebate at 6 per Cent.

The Second Part.

Shews the measuring of Land, Board, Timber, &c. correcting the false ways used by many therein.

Also the Art of Gauging much enlarged, shewing not only the measuring of Wine, Beer, and Ale-Vessels, but also the Gauging of all manner of Brewers Tuns.

With Tables of the Excise of Beer and Ale.

Also many other Rules and Tables of Weights and Measures, Forreign and Domestick, Tables of Accounts, Expences, &c. being of daily use for most men:

The Sixth Edition; by Henry Phillips.

L O N D O N , Printed for Thomas Burrell at his Shop under St. Dunstons Church in Fleet-street. 1670.

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To the Reader.

Courteous Reader,

THis little Book was almost utterly destroyed and lost in our late sad and lamentable Desolation, by the furious Flames, the Book seller saving not one of them. Alas, how could a little Paper scape, when so many strong Houses, and stately Temples could not resist, but were reduced to dust and ashes: But yet, as I hope to see our Famous City to be built again, and that in a more convenient and beautiful Form and Fashion, by the careful Order and Directions of our most Gracious Sovereign, the Kings Majesty, and the High and Honourable Court of Parliament) and by the ready Conformity of our Citizens thereunto: So I have taken some pains, not only to revive and reprint this Book, but have added many Observations, Rules, and Tables, very necessary in this juncture of time,

about the true worth and value of these ruined Foundations, and for the composing of all differences and questions which may arise between Landlords and Tenants, concerning their Interest in these Foundations, and the cost and charges of the building thereof, and also for the reckoning up the cost and charges of all Party-Walls between House and House: all which I hope will give good satisfaction to most men; and so be a means not only of improving the Book, but of forwarding the building of our Desolate City.

I have also added many things concerning Gauging, shewing how to finde the true content of all manner of Brewers Tuns, and calculated new Tables for that purpose; as also for the ready reckoning up of the Excise of Beer and Ale.

By all which I hope I have made the Book, though not much bigger, yet much better: So not doubting to finde your kinde acceptance, as I have done often formerly. I rest, Yours,
Henry Phillips.



Rules and Directions for the Purchasing the Ground Plots and Foundations of Houses lately burned in the City: and for the stating of the Interest and Claims between Landlord and Tenant in the said Foundations, in order to the Building thereof, and shewing the true value of all party Walls.

Courteous Reader,

THis business being of so great concernment and falling in my way, I could not but take some notice thereof; yet I will not take upon me to be a judge, absolutely to binde men to my rules; but only shew you, how by my Tables of Purchases, you may be able to give a reasonable value of these things, and so know when and how to make a good bargain either in buying or selling.

Now there being many and divers cases, and some of them more hard and intricate than others, it will be the best way to begin with such as are the most plain and

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simple questions ; and so they will lead and help to direct in those which are more difficult and perplexed.

The first question therefore shall be concerning the true value and worth of these foundations, what may be the best way to judge and reckon the true value of them ?

There are several ways which many men use to value these foundations, by comparing whereof, you may the better judge both of the way to value them by, and also of the true worth of the said Foundations.

First, Some value them by their length or breadth toward the street, reckoning every foot in front to be worth 4, 5, 6, 8, or 10 shillings yearly, according to the street or place they stand in ; and this yearly value they reckon at 20 years purchase, and so every foot in front is worth 4, 5, 6, 8, or 10 pounds. But this way is very uncertain for there is not only much difference in price in several Streets, but likewise there is much difference in the depth or length of Houses, which may cause much variety in the price and value thereof : so that this way can be no certain or general rule given, for many things being to be considered. Besides hereby men will be very ready to deceive themselves, and value them at too low

rate

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rate. For a foot is so small a measure, that men may count 10 *l.* a great price for a foot of ground. but I shall shew you that it may be worth 15 or 20 *l.* in many places.

Secondly, Others there are who value these foundations by their length and breadth, measured by the foot; reckoning every foot square to be worth three or four shillings. But this way will deceive you as much, or more, than the other, if you are not careful to set a good rate upon each foot of ground; for a foot is so small a measure, that men think it little worth: so that this ground being scant and precious, is ready to be too much undervalued, one foot of Ground here being worth 8 or 10 shillings, which in Land in the Countrey, is not worth half a farthing, though you reckon the Land at 20 shillings an Acre, and 20 pound the Purchase; for so it is worth but one penny a Yard, and every yard hath nine foot.

The way therefore which I shall prescribe, as more general and certain for the valuing of these foundations, shall be this.

Get a true and indifferent estimate of the yearly rent of these houses, what they were formerly worth at a good handsome moderate rack Rent, without any abatement or diminution thereof by fines, or any other

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other considerations : the which being known, you may reckon the true value of these foundations to be worth between four and five years purchase , according to the said yearly Rent ; that is, about the third part of the full worth or purchase of the fee simple of the house. And that this is a very fair and moderate value of these Foundations, I shall demonstrate unto you by these considerations.

First, I take it for granted, that a good fair house, standing well and conveniently, may be worth 12 years purchase at the least.

Secondly, I finde by several inquiries and observations, that an house of the third rate, fronting the high Streets, may be built at the most, for 8 years Rent of the former house : so that if the house was worth 50 or 60 pounds a year, it may be built for 400 pound, or thereabout.

Thirdly, if you take this 8 years purchase for the Building, out of 12 years purchase for the fee simple, there will remain 4 years purchase for the worth of the foundation, which is full one third part of the full value of the said house. Now this I suppose is as low a reckoning as can be made of the value of houses, to value them but at 12 years purchase, whereas they are rather

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rather worth 14 or 15 years purchase; and so if 8 years purchase will build them, the foundation, or ground plot, may be worth 4 or 5 years purchase very well. And as for the charges of the Building that will not amount to more than 8 years purchase, as I shall shew you presently. And I doubt not when those houses are new built, they will yield as much rent as formerly, and be worth as much, or more, for sale: yea, some Ground and Houses may be much improved; and therefore upon these grounds and reasons, I state this first question concerning the value of these foundations, that it doth amount at least to the third part of the value of the former house, while standing, that is about 5 years purchase of the former rent.

There is nothing can be objected against this, if the charges of Building doth not exceed 8 years purchase; therefore for the clearing of this, Suppose an house, which is one rod, or 16 foot and an half in front, and two rods deep, the compass of this house will be 6 rods; and if this house stand in the high Streets, having a Cellar, and 4 Stories, the height thereof will be 50 foot, or 3 rods: so that there will be 18 rod of Brickwork in the Wall, which may all be reduced to a brick and an half thick,

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and

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and so each rod of Brick-work takes up 4500 Bricks, and will cost about 7*l*. the building, which will come to in all 126*l*. The timber-work for Floors, Windows, and Roofs may cost as much more; and the Tyling, Plaistering, Lead, and Glas-sing, as much more also: so that the whole amounts to 378 pounds: the allowance for the Party Walls will very well pay for the Chimneyes. So that this house cannot amount to above 400 pound the Building; and such an house standing in any of the high Streets, cannot be worth less than 50 pound a year, which in 8 years comes to 400 pound: so that the building cannot cost above 8 years purchase. Yea, if you reckon this house at 60 pound a year, as it may very well yield in some places, then 7 years purchase, which amounts to 420 pound, will very well build it.

Now as I laid before, if the house may be built for 7 or 8 years purchase. and may be sold for 14 or 15 years purchase, the ground may very well be worth 5 or 6 years purchase, if not more in some places.

For here I must tell you, though this way of valuing the ground be as equal and general a rule as can be; yet there must be some respect had to the place where the house stands. For if this house should stand

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in some ordinary Lane, it would not yield above 30 pound a year, which is but half the rent aforesaid, and yet it would cost 300 pound the building, which is 10 years purchase; so that there remains but 5 years purchase for the value of the ground.

Therefore if you will more exactly judge and determine of the worth of these foundations, it will be best to range them into three sorts, reckoning the first and lowest sort of houses which yield least rent, at 4 years purchase; the second sort of houses which will yield a moderate rent at 5 years purchase; the third sort of houses which will yield the rent, may be reckoned at 6 years purchase. And according to this account you may know very well how to make your bargain for your advantage, either in buying or selling these foundations.

And you will finde this way much more certain than reckoning of them by the foot, either in front only, or in front and depth, which will deceive you, and gives too low an estimate of these foundations.

For now, suppose the house mentioned before, being about 16 foot in front, standing in some high street in a good place, you may think that 10 shillings a foot, that is 8 pound a year; and this reckoned at 20 years.

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years purchase which comes to 160 pound to be a good and sufficient price for the said ground ; and this is as high a rate as most men will judge it that way. Whereas I have proved plainly, that if the house yields but 50 pound a year, and reckon the ground but at 5 years purchase, it will come to 250 pound. But if the house yield 60 pound a year, then at 5 years purchase the ground is worth 300 pound, and at 6 years purchase (which it may be reckoned at in some places) it comes to 360 pound, which is above twice the price the other way.

If you reckon these foundations by the foot, not only in front, but in depth ; so the front being about 16 foot, and the depth 32 foot ; these two multiplied together, make the content of the foundation to be 512 foot. Now who would judge so small a parcel of Ground as one foot square to be worth 10 or 12 shillings ; men rather account it but at 3 or 4 shillings. But if you reckon it at 10 shillings a foot, it will yield but 256 pound, which is the lowest rate that it can be worth, being reckoned the other way.

And thus I hope I have fully and plainly resolved this question, having been the more large in it, because it is a question wherein so many are concerned ; and it being

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being the foundation of all the rest, which must uphold and help us in the resolution of the following cases.

The second Question.

A Landlord having a plot of Ground but wanting money to build, and being not willing to sell, hath found out one that will build upon it, who can lay no claim or title to the Ground: Now the question is, what rent, and what term of years may be fairly given and taken between this Landlord and his Tenant, in consideration for his building the house upon the said ruined foundation?

In answer hereunto, First, Consider that it cannot be expected that any less rent should be paid, than the yearly value of the ground is worth; which, by what was said before, may be accounted to be a third part of the former yearly Rent: so that if the house was formerly worth 60 pound a year, then 20 pound may be at least allowed for the yearly rent hereafter.

Secondly, If the Tenant be at the whole cost and charges of building the house, there is as little reason that he should pay any more rent than the Ground Plot it self

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is worth : for so he should pay rent for his own money bestowed in building the said house.

Thirdly, It is plain therefore that the Landlord should allow him such a competent number of years, that may bring him in his cost and charges again, by the abatement of the two thirds of the former rent ; and so the former rent will be satisfied, one third being to be paid for rent to the Landlord, and the other two thirds being allowed for the building of the said house.

Now the stress of the question is, what number of years may be allowed and taken in this case ?

For answer hereunto, your best way will be to reckon it up after this manner.

Suppose the house aforesaid to be worth 60 pound a year, a third part thereof being 20 pound, may be reserved for the rent, the other two thirds being 40 pound a year, is to be bought out (as it were by way of a fine) being to be laid out in building the house. Now this 40 pound a year, in 10 years, comes to 400 pound, and will be sufficient to build the house : so that it appears that the Landlord is to allow him such a number of years in his Lease as may be worth 10 years purchase ; and so the Tenant by his building doth purchase the a-

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batement of 40 pound a year, and payes only 20 pound a year rent.

Now the question is, how many years Lease may be allowed for this 10 years purchase?

To resolve this, you shall finde by my Tables of purchase, that a Lease of 21 years is worth 10 years purchase after the rate of 8 *per Cent.* And so long a Landlord may very well give; but a Tenant will hardly be content to take it, though hereby he makes 8 *per Cent.* of his Money. For most men are apt to reckon these short Leases at too low a rate, and will give greater Fines, and bestow their cost more willingly upon a longer Lease, though it appears by the Tables, that a longer Lease is not worth so much more as men ordinarily value them at.

But I suppose that a Lease of 31 years, will be a very fair and reasonable time, as any Tenant in this case can demand; whereby he shall have almost 10 pound *per Cent.* for his money, as you may see by the Tables of 10 pound *per Cent.* And these houses, if well and strongly built, according to the Act (by the blessing of God) will not be so subj:ct to that great and common casualty of Fire as formerly; and so the money laid out upon them will be so much the more safe

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safe and sure. Longer time than this I would wish none to allow ; and the Landlord may well think this time too long, being forced (perhaps to make hard shift) to live upon the third part of his former rent all this while.

And therefore if the Landlord be any way able, it will be better for him to build himself, than grant longer Leases : or if the Landlord and Tenant joyn both together in building, then for every hundred pound laid out by the Landlord, he may require more rent by ten pound a year than the foresaid ground rent : and for every hundred pound laid out by the Tenant, he is to pay the less rent by ten pound a year of what the former rent of the house was, and so to build upon a Lease of 31 years. This I conceive is as fair and equal terms as can be desired on both sides.

The third Case or Question.

IS, Concerning controversies between Landlord and Tenant, where there is engagements by Leases, either with fines or without fines.

These cases are much more difficult than the former, where there is no engagements ;

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and if men should exact and stand upon the rigour of the Law, many men might receive much wrong and damage; and therefore the honourable Parliament hath taken especial care for the more equal and reasonable regulating of these Controversies. I shall not herein intrench upon their Office, neither can I binde any to follow my advice, any farther than they see it right and equal; and so by this means (perhaps) I may save them and others much pains and trouble; in hearing and pleading these controversies.

In the first place it must needs be granted, that by the rigour of the Law the Tenant may be enforced to build: for he being bound by his Covenants to repair, support, maintain, and uphold the house; and at the end or expiration of his Lease or forfeiture of the same to deliver the house unto his Landlord repaired, supported, maintained, and upheld: how can he do this when the house is burned down, without new building the same.

And this, though it may seem very harsh in some cases, yet it may thus be pleaded for.

First, that no man will take a Lease of an house, and enter into the engagements, but he hath some reason or considerations

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to encourage and provoke him thereunto, either by the worth of the penyworth, or the conveniency for his Trade and Living, or to avoid the trouble and charge of removing, or some such considerations.

Secondly, no man doth take an house by Lease, but he must needs look to be at some cost and charges by ordinary reparations, and many casualties which may happen by Winds and Tempests, blowing down Chimneyes and corners of houses, which I suppose men make no question but they are bound to repair.

Thirdly, were it not for these Covenants, many Tenants would neglect these reasonable and necessary reparations, and suffer houses to go to ruine in a little time, to the great loss and damage of the Landlord.

Lastly and chiefly, many houses which belong to the City, and publick Societies, as Halls, Hospitals, Colledges, and such like are usually let at a small Rent, and a moderate Fine; and it is very fit such Tenants should be bound to good reparations. And this I suppose was the first beginning, and reason of these manner of Covenants: when Rents were low and reasonable, then men desired to have Leases of them, and were willing to be at the cost not only of repairing, but of re-building, and building new

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unto new Structures upon them. And so after-
ward, though rents did grow higher, yet
Landlords would still tye men to the same
articles and Covenants, without any respect
to the goodness and badness of the bar-
gain: all kinde of Leases being generally
made in the same form and words, which
the Tenant in regard of the commonness
thereof, binds himself thereunto, taking
them only for words of course, without
due consideration thereof.

But this is very unjust and unreasonable,
especially where men pay great Rents, or
buy them out with great Fines. For if
Landlords could, and really and intention-
ally did so binde all their Tenants, then
why should not Houses be valued at as high
a rate as Land; whereas the undervaluing
of houses is upon the account of the char-
ges that may happen by these casualties and
dilapidations. Now if the Landlord have
his allowance for it in buying, then the Te-
nant hath no reason to be bound to stand to
the cost and charges thereof, unless he be
very well allowed for it in his Rent or Fine.

Besides, The Landlords must consider
that their houses will grow old, and Te-
nants will not alwayes take them on these
termes, but they must pull them down and
build them many times at the expiration of
their Leases.

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Lastly, In this general calamity where in all men have too great a share, it is not fit that any should be unreasonably oppressed; but that as near as may be, there may be an equality in the loss and charges, that the burden may be the more easily undergone by both parties, which is the intent of the Act of Parliament for this purpose.

Now the business is to propose some rules or directions how this may be done, which I shall do in two cases, which will include most particulars.

First, where there is a great rent paid yearly, and but little or no fine.

Here let the charges of the house to be built be considered, and being known, let it be divided into three equal parts. One third part of these charges the Landlord may pay, because (as I said before) these houses are allowed for in the buying and purchasing thereof to be subject to casualties, and therefore are sold at 13 or 14 years purchase; whereas Land is sold at 20 years purchase: so that they are a 3d. part cheaper than Land.

The other two thirds may equally be divided between the Landlord and the Tenant, and so the Tenant will be at one third part of the charges of the Building: upon these terms either the Landlord, or the Tenant may build, and the Tenant may take

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where a new Lease thereof at the former Rent, for
is not 21 or 31 years ; or else give up his whole
ppref right and interest to his Landlord, paying his
may be third part toward the charges of the build-
that so ing, as they shall agree between themselves.

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e rule was any thing strong and good, and at any
which reasonable rent : for the Tenant being
clude bound, must not think to escape scotfree,
paid though he would renounce his claim to the
to be house : and where the Tenant hath a minde
let in to claim any interest in the house, he can-
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s are Landlord, though he pay two thirds of the
a fine charges, yet may consider, that what the
and Tenant layes out is all lost (as it were) un-
hase to him, and he shall not receive one peny
ase: so of it again, but must still keep on paying
Land his rent as formerly : But the Landlord
be di will be upon the receiving hand ; and
e Te though his house may be so much the dearer
third to him, yet it still yields him a good in-
upon come of Rent.

The second of these cases is where the
Te Tenant hath paid a considerable Fine, and
take so may be more ready and earnest to make
his claim of the Landlord ; and yet also
payes

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pays a considerable rent, above the worth of the ground rent.

In the deciding of this controversy First, the charges of the building had been to be divided (as before) into three equal parts, and so the Tenant to pay one third part thereof, and the Landlord the other two: and so the Tenant paying the same rent as formerly, to enjoy it for the remainder of his Lease.

If the Lease be short, then according to the former fine, the Tenant may renew his Lease, and make it up 21 years. As for example, Suppose a Tenant hath paid 100 pounds for a Fine, for a Lease of 21 years, and nine years thereof are expired, and so 12 years are remaining.

For the accounting hereof you may please to take notice, that these Fines may be made and allowed for, according to the Table of 8 per Cent. which allows 10 years purchase for 21 years: by which reckoning 100 pound Fine cuts off 10 pound a year from the Rent; and so every 10 pound cuts off 20 shillings. Now this Table sheweth that 1 l. for 21 years is worth 10 l. or 10 years purchase; and likewise that 1 l. for 12 years remaining is worth 7 l. 10 s. that is, 7 years and an half purchase: so that every 10 l. of the Fine which was paid for

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the whole 21 years is worth 7*l*. 10*s*. for the 2 remaining years.

Now then, as 10 times 10 pound makes an 100*l*.

So ten times 7*l*. 10*s*. make 75*l*.

Which taken out of 100, rests 25*l*.

So that there is 75*l*. due to the Tenant of his foresaid Fine of 100*l*.

Now if the Tenant will enjoy the house and have his Lease made up again to 21 years, at the same rent as formerly: then he must pay a third part of the charges of the building, and make up his Fine again 100*l*, by adding 25 pound to the said 75 pound, which makes it 100 pound.

But if the Landlord agree to buy out the Tenant, then the Landlord must allow the Tenant his 75 pound out of his third part of the charges, which the Tenant is to pay toward the building of the house.

And thus going by the Table of 8 per cent. you may reckon what is to be allowed for any Fine, for any number of years, reckoning every 10 pound of the Fine for 1 years, to be worth the sum set against the remaining number of years.

Thus, if there be but 5 years remaining of the said Lease, against 5 years you finde 3*l*. 19*s*. 10*d*. that is almost 4*l*. and so for every 10*l*. of the Fine you must reckon

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kon 4 l. which for the 100l. comes to 40 For
So much being good to the Tenant of the he b
former Fine. bui

This way and manner of reckoning an one-
agreement, will I conceive be very fair an B
reasonable for both parties, if the Lease der
made for no longer time than 21 years. to m

But if any Tenant that desires to bui mini
would have a longer Lease, and will n ther
agree upon these terms, but will have house
Lease of 31 years, I would not wish to be for
Landlord to stand off, and so hinder Bu
house perhaps a year or two building; elon
there is not much above a years purcha public
difference between a Lease of 21 and will u
years; which in accounting the Fine, w refcr
come to much, and yet will be a great person
encouragement to the Builder. f thi

Likewise, if any Landlord would enga ore n
his Tenant to lay out more than his th On
part or proportion; then for every efore,
which the Tenant layes out more thanount
third part, the Landlord may well ab orth
him 10l. a year rent, upon a Lease of buil
years: yea, rather than hinder his by ha
ing, he may abate so much upon a Lease ter at
31 years, provided the Rent remain And
will counter-value the Ground Rent, wh are l
I stated before to be a third part of effec
yearly Rent, reckoned at the full val ving
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For I shewed before, that any man (though he have no interest in the Ground) yet may build upon a Lease of 31 years, and pay one third part of the full rent of the house.

But all this which I have said must be understood of such houses where the Fines are moderate, that they do not too much diminish the yearly rent: For in other cases where men pay but 10. or 20 l. rent, for an house that is worth 40. or 60 l. there must be some other rules to direct you.

But these for the most part being such as belong to the City, or Companies, or some publick Rents; I make no question but they will use their tenants much better than I can describe them. What I write is for private persons, that they may know the true value of things between man and man, and may more reasonably demand it.

Only you may take notice of what I said before, that if the yearly rent do not amount above the third part of the true worth thereof, then any one may venture build upon a Lease of 31 years; especially having hopes to renew his Lease hereafter at a reasonable Fine.

And yet considering many of these Leases are looked upon, and have been formerly esteemed as good as some Coppy-holds, having been let at low rents, and very reasonable

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sonable Fines, I doubt not but the Tenants who have received the chief loss hereby will finde as much favour as formerly from their Landlords: so that whereas the Parliament in some cases allows the Judges between man and man to give 4 years time, they will also be as forward and ready to give full encouragement and satisfaction to their Tenants to the utmost of their power.

And indeed such Tenants who have lately paid a good round Fine, or have a very long time in their Lease; as many old Leases, which were lately enlarged to 40 years, and have yet above 40 years in the old Leases already) will have all the lie upon them, if they have no satisfaction and allowance given them from their Landlords, towards their charges in the building.

The last Question about these Buildings, be concerning the cost of the Party between house and house, what may be the plainest way of reckoning it up, so that every man may see what is his due to pay.

NOW to this purpose you must understand that Bricklayers use to reckon their work by the Pole, which is 16 foot and

Shire

<i>Shires</i>	Cities and Bishopricks	Market Towns	Parishes	Parks
26 Norfolk	Norwich	26	606	000
27 Oxford	Oxford	10	280	009
28 Rutland		2	48	004
29 Shropshire		14	270	027
30 Somerset.	Bath, Wells, Bristol	33	385	018
31 Stafford	Lichfield	13	130	038
32 Suffolk	Coventry.	28	575	027
33 Surry		9	140	017
34 Sussex	Chichest.	18	312	033
35 Warwicksh.		15	158	016
36 Westmerl.		4	26	019
37 Wiltshire	Salisbury	19	304	029
38 Worcester	Worcest.	10	132	016
39 Yorkshire	York	46	563	072
40 Anglesey		2	74	000
41 Brecknock		3	61	002
42 Cardigan		4	64	000
43 Carmarth		6	87	002
44 Carnarv.		5	68	000
45 Denbysh.		3	57	006
46 Flintshire	Bangor.	1	28	002
47 Glamorg.		7	118	005
48 Montgom.	St. Asaph	6	47	000
49 Monmouth		6	127	008
50 Merioneth.		3	27	000
51 Pembroke	S. Davids	6	245	003
52 Radnorsh.		4	22	000
<i>Shires 52</i>	<i>I 25,26</i>	<i>I 654</i>	<i>9725</i>	<i>1781</i>

*Of the Reduction of Weights of
veral Places.*

*One pound Avoir-du-
poiz weight at Lon.
makes at these seve-
ral places.*

*One pound weight
in any of the
places, makes
Lo. of Avoir-d*

<i>li. parts.</i>		<i>li. parts.</i>
0,9615	Antwerp	1,04
0,9	Amsterdam	1,1111
0,91	Abbeville	1,0989
1,282	Ancona	0,78
1,12	Avignon	0,8928
0,91	Bordeaux	1,0989
0,91	Burgoine	1,0989
1,25	Bollonio	0,8
0,98	Bridges	1,02
1,3698	Callabria	0,73
1,07	Callais	0,9345
0,8474	Constantinople	1,1816
0,91	Diep	1,0989
1,16	Dantzick	0,862
1,3333	Ferrara	0,75
1,288	Florence	0,78
1,06	Flanders, all	1,9433
0,9345	Geneva	0,07
1,4084	Genoa <i>subile</i>	0,71
1,4285	Genoa <i>Gross</i>	0,7

One li.
we
ma
up
li.p
0,9
0,9
0,8
1,0
0,9
0,9
1,3
1,4
1,3
0,8
1,4
0,8
0,8
1,3
1,1
1,2
0,8
0,9
1,0
1,1
1,2
1,5
0,9
0,8

One li. Avoir-du-poir
weight at London
makes at these se-
veral places.

One li. at any of the
places makes at
Lond. of Avoir-
du-poir weight.

weig
f the
akes
oir-d

li. paves.		li parts.
0,92	Hamburg	1,0865
0,95	Holland	1,0526
0,881	Lyxborne	1,135
1,07	Lyons common	0,9345
0,98	Silk weight	1,0204
0,9	Customers wt.	1,1111
1,3333	Leighorn	0,75
1,4285	Millan	0,7
1,3333	Mirandola	0,75
0,88	Norimberg	1,2363
1,4084	Naples	0,71
0,89	Paris	1,1235
0,83	Prague	1,2048
1,3888	Placencia	0,72
1,12	Rochel	0,8928
1,27	Rome	0,7874
0,875	Rovan vicont	1,1428
0,9017	common wt.	1,1089
1,08	Sivil	0,9259
1,12	Tholoufa	0,8928
1,2195	Turen	0,82
1,5625	Venice suble	0,64
0,9433	gross	1,06
0,813	Vienna	1,23

A Table for the Reduction of the Measures of several places.

One Ell at Lon. makes at these several places, Ells, Aulnes, Braces, or, &c.		One Ell, Auln, Braces, &c. at these places, makes London.	
1. parts.			Ells, parts.
1,6949	Amsterdam		0,59
1,6666	Antwerp		0,6
1,64	Bridges		0,6097
1,65	Arras		0,606
1,74	Norimberg		0,5747
2,08	Colen		0,4807
1,66	Lisle	Ells.	0,6024
1,57	Mastricht		0,6369
2,0866	Frankford		0,4792
13,833	Dantzick		0,7228
1,45	Vienna		0,6896
<hr/>			
0,95	Paris	Aulnes.	1,0526
1,03	Rovan		0,9708
1,0166	Lyons		0,9836
1,57	Callais		0,6369
<hr/>			
1,8	Venice, linnen	Braces.	0,5555
1,96	Lucques, Silk		0,5102
2,0			0,5
2,4	Florence		0,4901
2,3	Millan		0,4347
2,0	Leghorn		0,5
1,0328	Madera's		0,9681

To the Reader.

half square every way, and 3000 of Bricks will make a Wall of a pole square, of the thickness of one Brick, 4500 will make a Wall of a Pole square, whose thickness shall be one brick and an half. And 6000 Bricks will make a Wall a Pole square, whose thickness shall be 2 Bricks: so that if you know how many Pole there is in the Wall; by the thickness thereof you may know the number of the Bricks, and thereby the cost of making thereof.

But this measuring by the Pole, though it may do well in a long Wall of a Garden or Park, yet in measuring of the Wall of an house is very inconvenient; and the parts thereof will not be so plain and exactly measured as by some lesser measure; whereby you may more readily and exactly measure every story in an house by it self, according to the different thickness of the Wall.

Now, this I would advise to be done by the Foot, namely that you measure how many foot long, and how many foot high the Cellar is, and all the other Stories in the house, and then the following Tables will shew you (according to the thickness of the Wall) how many Bricks your neighbour is to pay for towards his Party-Wall. For which these two Tables, will very well

To the Reader.

serve for these Walls are to be made part of them 2 Bricks thick, part of them one and an half thick. Now where the Wall is 2 Bricks thick, there the Table of one Brick thick will shew the half thereof; and where the Wall is one Brick and an half thick, there the other Table of three quarters of a Brick thick, will shew the number of Bricks to be accounted for the half of the Wall.

Now knowing the number of the Bricks which go to the making of the Wall, you may easily reckon the cost of the Mortar and Workmanship thereof, and so reckon up the cost of the whole, which you will finde to be about 30s. for every 1000 of Bricks, Bricks being now somewhat dear, about 18 or 20s. a thousand.

Thus for example, Suppose an house of the biggest rate, the side-wall thereof being 30 foot long, and you would know how many Bricks are to be paid for towards the party-wall.

First, measure the Cellar, where the Wall is to be 2 Bricks thick, the length thereof is 30 feet, and the depth 7 feet, finde this length in the side, and the depth in the top of the Table, and in the square metting of the Table for one Brick thick, you shall finde 2314 Bricks are to be paid for.

Then

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Foot long.

*A Table for one Brick in thickness, or
the half of two Bricks.*

The Walls height in Feet.

	I 3	I	II	III	IIII	V
	Bricks	Bricks	Bricks	Bricks	Bricks	Bricks
1	5	11	22	33	44	55
2	11	22	44	66	88	110
3	16	33	66	99	132	165
4	22	44	88	132	176	220
5	27	55	110	165	220	275
6	33	66	132	198	264	331
7	39	77	154	231	309	386
8	44	88	176	264	353	441
9	50	99	198	298	397	496
10	55	110	220	331	441	551
11	61	121	242	364	485	606
12	66	132	264	397	529	661
13	72	143	286	430	573	716
14	77	154	309	462	617	771
15	83	165	331	496	661	826
16	88	176	353	529	705	882
17	94	187	375	562	749	937
18	99	198	397	595	793	992
19	105	209	419	628	837	1047
20	111	220	441	661	882	1102
21	116	231	463	694	926	1157
22	121	242	485	726	970	1212
23	127	253	507	760	1014	1267
24	132	264	529	793	1058	1322
25	138	275	551	826	1102	1377
26	143	286	573	860	1146	1432
27	154	309	617	926	1234	1543
30	165	331	661	992	1322	1653
40	220	441	881	1322	1763	2204
50	275	551	1102	1653	2204	2755

Foot long.

*A Table for one Brick in thickness,
or the half of two Bricks.*

The wall feet in height.

	VI	VII	VIII	IX	X
	Bricks	Bricks	Bricks	Bricks	Bricks
1	66	77	85	99	110
2	132	154	176	198	220
3	198	231	264	298	331
4	264	309	353	397	441
5	331	386	441	496	551
6	397	463	529	595	661
7	463	540	617	694	771
8	529	617	705	793	882
9	595	694	793	893	992
10	661	771	882	992	1102
11	727	848	970	1091	1212
12	793	926	1058	1190	1322
13	859	1003	1146	1289	1433
14	926	1080	1234	1388	1543
15	992	1157	1322	1488	1653
16	1058	1234	1410	1587	1763
17	1124	1311	1499	1686	1873
18	1190	1388	1587	1785	1983
19	1256	1466	1675	1884	2094
20	1322	1543	1763	1983	2204
21	1388	1620	1851	2083	2314
22	1455	1697	1939	2184	2424
23	1520	1774	2028	2281	2534
24	1587	1851	2116	2380	2645
25	1653	1928	2204	2479	2755
26	1719	2006	2292	2578	2865
28	1851	22160	2468	2777	3085
30	1983	2314	2645	2975	3306
40	2645	3085	3526	3967	4408
50	3306	3857	4408	4959	5510

Foot long.

To the Reader.

Then the first Story being likewise 30 foot long, and 10 foot high, and also 2 Bricks thick, the same Table shews for the allowance for this, 3306

The second story is also 30 foot long, and 10 foot and an half high, but the Wall is to be but a Brick and an half thick; the half whereof is 3 quarters of a Brick: and this in the Table of 3 quarters of a Brick, yields for 30 foot long, and 10 foot high, 2479

And for the half foot more in height 124

The third story is 9 foot high, and 30 foot long, being likewise a Brick and half thick; and for this the Table shews the half to pay for is 2231

The fourth story is 8 foot $\frac{1}{2}$ high, and 30 foot long, for the 8 foot the Table shewes 1983

And for the half foot 0124

All which added together, make 12559 which are to be paid for the half of the party Wall, which at 30s. a thousand comes to 18l. 16s. 9d.

Thus you may see what any party Wall comes to, though your Neighbours house joyns never so little or much to your house, more plainly and exactly than you can by measuring by the whole Pole.

To the Reader.

And whereas the Floors of the several Stories add somewhat to the height, you may add somewhat for them according to you find them in thickness.

Lastly, for the Garrets, the Walls thereof being one Brick thick, you may take the number in the Table of one Brick thickness, and add it to the rest of the account.

All the difference that can be between one neighbour and another herein, will be about the price of the Bricks, and the Lime and Workmanship, which at the present is very dear and uncertain, but if neighbours build together, they will easily determine it; if they do not, yet the first Builder is sufficiently provided by his Workmen to testify his cost; and by the Act of Parliament is allowed full satisfaction, with interest from the time of his Building.

One Ell at London,
makes at any of
these places, Ells,
Aulas, &c.

One Ell, Auln, Brace,
&c. at any of those
places, makes at
London,

o parts.		Ells, parts.
1,35	Sivil	0,7407
1,	Lisbone	1,
1,3875	Castile Vares	0,7207
1,3625	Andaluzia	0,7339
1 3625	Granado	0,7339
4,8083	Genoa Palms	0,2079
0,55	Saragose	1,1881
0,56	Rome Canes	1,7857
0,7125	Barcelona	1,4039
1,2125	Valentia	0,8247

(24)

The manner of using these Tables is after this manner, in such questions as these.

If one pound Avoir-du-poiz at London doth make at Amsterdam 0 l. 9, parts, how much will 112 l. at London, make at Amsterdam. Work by the Rule of three :

1 li. 0.9 :: 112 li. facit 108 li. 8. pts.

$$\begin{array}{r} 9 \\ \hline 100 \overline{) 8} \end{array}$$

Again, If one pound at Antwerp is 1 li. 04 of the Avoir-du-poiz weight at London, then how much is 108 li, at Antwerp of the London weight ?

1 li. 1.04 :: 108 li. facit 112 li. 32 pts.

$$\begin{array}{r} 1,04 \\ \hline 432 \\ 108 \overline{) 432} \\ \hline 112 \overline{) 32} \end{array}$$

being a little above our hundred weight.

The like you may do for any other number of pounds, or for any number of Ells, or any other measure, to reduce the one to the other.

A Table for three quarters of a Brick thick,
being the half of a Brick and half thick.

The Wall Foot high.

	I	II	III	IIII	V
	Bricks	Bricks	Bricks	Bricks	Bcks
1	4	8	17	25	33
2	8	17	33	50	66
3	12	25	50	74	99
4	17	33	66	99	132
5	21	41	83	124	165
6	25	50	99	149	198
7	29	58	116	174	231
8	33	66	132	198	264
9	37	74	149	223	298
10	41	83	165	248	331
11	45	91	182	273	364
12	50	99	198	298	397
13	54	107	215	321	430
14	58	116	231	347	463
15	62	124	248	373	496
16	66	132	264	397	529
17	70	140	281	421	562
18	74	149	298	446	595
19	79	157	314	471	628
20	83	165	331	496	661
21	87	174	347	521	694
22	91	182	369	545	727
23	95	190	380	570	760
24	99	198	397	595	793
25	103	206	413	620	826
26	107	215	430	645	860
27	111	223	446	670	893
28	116	231	463	694	926
29	120	240	480	719	959
30	124	248	496	744	992
40	165	331	661	991	1321
50	207	413	816	1240	1653

A Table for 3 quarters of a Brick thick,
ing the half of a Brick and an half.

The Wall foot high.

	VI	VII	VIII	IX	X
	Bricks	Bricks	Bricks	Bricks	Bricks
1					
1	50	58	66	74	
2	99	116	133	149	
3	149	174	198	223	
4	198	231	264	298	
5	248	289	331	372	
6	298	347	397	446	
7	247	405	463	521	
8	297	463	529	595	
9	446	521	595	669	
10	496	579	661	744	
11	545	636	727	818	
12	595	694	793	893	
13	645	752	860	967	
14	694	810	926	1041	
15	744	868	992	1117	
16	793	926	1058	1199	
17	843	983	1124	1264	
18	893	1041	1190	1339	
19	942	1099	1256	1413	
20	992	1157	1322	1488	
21	1041	1215	1388	1562	
22	1091	1273	1455	1636	
23	1140	1331	1521	1711	
24	1190	1388	1587	1785	
25	1240	1446	1653	1860	
26	1289	1504	1709	1934	
28	1388	1620	1851	2083	
30	1488	1736	1983	2231	
40	1983	2314	2625	2975	
50	2479	2893	3306	3719	

Feet long.

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FINIS.

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Table of Proportions for Brick Walls, in the building of all sorts of Houses in the City of London, according to the Act of Parliament.

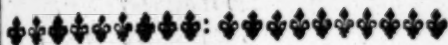
The sorts of Houses.	Several Stories	Foot in height	B. length in thick.	S. length in thick.
The first of least sort of Houses, fronting bye-Streets and Lanes are to have:	Cellars	6 ¹ / ₂	2	1 ¹ / ₂
	1 Story	9	2	1 ¹ / ₂
	2 Stories	9	1 ¹ / ₂	1 ¹ / ₂
	Garrets		1	1
<i>The thickness of the party-Walls between house and house.</i>				
The second sort of Houses fronting lesser Streets, and Lanes of note, and the Thames side are to have.	Cellars	6 ¹ / ₂	1	2
	1 Story	10 ¹ / ₂	2	2
	2 Stories	10	1 ¹ / ₂	1 ¹ / ₂
	3 Stories	9	1 ¹ / ₂	1 ¹ / ₂
The third sort of Houses fronting the high Streets are to have.	Garrets		1	1
	Cellars		2	2
	1 Story	10 ¹ / ₂	2	2
	2 Stories	10 ¹ / ₂	1 ¹ / ₂	1 ¹ / ₂
	3 Stories	9	1 ¹ / ₂	1 ¹ / ₂
	4 Stories	8 ¹ / ₂	1	1
	Garrets		1	1

The depth of the Cellars, and height of the several Stories.

The thickness of the walls of each house in Front and Rear.

ERRATA.

Page.	Line.	Fault.	Correct.
27	5	109	106
31	5	17.1	17.2
44	2	or the	of the
52	12	566	5663
53	7	5555	55555
53	8	11 pence	01. q
60	6	rate	rules
68	30	10.53	10.35
71	30	11.2	1.12
87	17	5885	5945
88	13	18	183
92	21	ufe	rule
112	18	as	one
119	1	102	10
140	16	12	18
141	17	of	or
141	21	and	adde
142	4	1000	100
156	7	198	189
194	9	4,5958	misplac't
196	14	parts	pints
205	4	B	
	5	parts	B, parts.
204	12	Comical	Conical
218	18	118	128
224	12	pence	peece



T H E

Purchasers Pattern.

IN the buying and selling of Land, and in the letting and taking of Leases, either of Land or Houses, there are many things very considerable, which may all be reduced to these three general heads.

First, to the Law, to make the Bargain sure.

Secondly, to Reason and Judgment, to know the nature of the thing you purchase.

Thirdly, to Arithmetick, to find out the true value thereof.

My chief purpose herein is to speak of this last, referring you in the other two, to your own judgment, and the counsel of others: yet because I am loth to let those (who need some instructions herein, and will be willing to learn) go altogether without, I shall briefly speak somewhat to each of these.

And in the first place, as to matter of Law, take it as I finde it summed up in these few verses.

*First, see the Land which thou intend'st to buy
Within the Sellers title cleare doth lie;*

C

And

And that no woman to it doth lay claim,
 By Dowry, Joynture, or some other name,
 That may it cumber. Know if bound or free
 The Tenure stand, and that from each Feoffee
 It be releas'd. That th' Seller be so old,
 That he may lawful sell, thow lawful both
 Have special care that it not morgag'd lie,
 Nor be intailed on Posterity.

Then if it stand in Staute, bound or no :
 Be well advis'd what Quit-rent out must go
 What Custom-service hath been done of old
 By those who formerly the same did hold.
 And if a wedded woman put to sale,
 Deal not with her, unless she bring her Male
 For she doth under Covert-baron go,
 Although sometimes some also traffique so
 Thy bargaine being made, and all this done,
 Have special care to make thy Charter run
 To thee, thine Heirs, Executors, Assignes,
 For that, beyond thy life, securely binds.
 These things fore-knownn, and done, you may
 prevent

Those things rash buyers many times repeat,
 And yet when as you have done all you can
 If you'l be sure, deal with an honest man.

Much might be said to this in point of
 law ; but neither my skill nor time will
 ford it. It is the best way for every one,
 to trust too much to his own skill, but to

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 is all

the help of some skilful Lawyer, and knowing Scrivener. And I shall only adde this, that though the man you deal withal, have the repute of an honest man: yet trust not too much upon that; but be careful to have all the assurance made unto you, as if he were your utter enemy, or a very K.

IN the second place, before you can know the true value of the thing to be purchased, you must well consider the nature of the thing, and the casualties that it may be subject to; and so according to the goodness and certainty thereof, you must cast up the price at a greater or lesser rate of profit.

And to this purpose in the first place, take notice, that the Rate allowed for Interest money, is the general ground and rule to estimate the value of any purchase by.

This was formerly in *Queen Elizabeths* dayes allowed to be 10 pound for an 100. But in King *James's* time, it was, upon very good ground brought down to 8 pound for an 100. And now of late it is allowed to take but 6 pound Interest for an 100. Now as the Interest of money falleth, so the price of all kinde of purchases riseth. This you may see in the following Tables. And it must needs be so, because the less profit is allowed, the greater principal must be

expended to bring in the same profit. Thus when money was at eight in the 100, then 75 pounds would bring in 6 pounds a year, whereas money being but at 6 in the 100, an 100 pounds will bring in but the said 6 pounds a year.

But yet you must not think that this rate allowed for Interest money, is the absolute rule of all Purchases; but as formerly when money went at 8 for an hundred, yet Land was worth 18 years purchase: so now money is at 6 for the hundred, Land is worth 20 years purchase. And though men who thus lay out their money upon Land have but five in the hundred profit for their money, yet there may be good reasons given, why men should be willing so to do.

First, Because though every thing be subject to casualty in this uncertain world, yet an estate in Land is less subject to danger, and of more sure continuance both for a mans own life, and his posterity after him.

Secondly, It hath been hitherto, and is like to be so still, that the price of money falls cheaper, and the price of Land rises dearer: and that not only (as I said before) in proportion to the rate of Interest, but in respect of the value of the things themselves; in such wise, that a Farme that for

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merly was worth but 30 pounds a year, is now worth 50 pounds, or more. So that the old Rents of Land, may in a short time be much improved, whereby the Land-Lord may in a short time mend his bargain, if it be any good penny-worth when he bought it.

Thirdly, In point of Piety, many men had rather lay out their money in Land, though with lesser profit; then let it out to Interest: Because Usury, through the ill practises of many, hath gotten such an odious name, and been so generally condemned by many godly men.

Fourthly, there is much equity herein. For as men who have greater Stocks, and Trade by whole-sale, may live upon a lesser rate of profit then those who have but small Stocks, and Trade by Retail: So men who have great Estates, to buy Land therewith, may very well lay out their money at less profit then other men, and yet live better thereof. Thus a man that hath 4000 pounds, may purchase therewith 200 pounds a year, and may live better thereupon, though he have but five pounds in the 100 profit for his money; then he that hath an Estate of 1000 pounds in money, and puts it out to Interest at six pounds for an hundred, can live of 60 pounds the year-

ly Interest thereof. And hereupon the Emperor *Justinian* made a Law that Noblemen and Earls should take but 4 pound Interest for 100. Artificers might take pound. Merchant Adventurers 12 pound and other men 6 pounds in an hundred.

And thus much for the price of Land in general. Here in *England* it is worth 30 years purchase. In other Countries, where money is plenty, and land scarce, it may be worth more; as in *Holland* land is worth 30 years purchase, and money scarce worth 3 or 4 *per Cent*. But in many other places it is worth less. Yea, as I am informed in *Lincoln-shire* very good land is sold for 16 years purchase: these things the buyer and seller must consider of, and do therein, as their own judgment, and their necessities, and opportunities offered, allow them the best bargain.

IN the next place it may be considered, what rate Leases of Land are first to be let. And that is according to the present rate of Interest money, whatever it be; whether 5, 6, 7, or 8 in the hundred.

For first, it is not fit that they should let more then their money will yield them because for the most part such Purchasers are men of smaller Estates, and such as

the most part, do with much care, cost, and pains, get their Rent for their Land-Lords, who live many times at ease; and if their Land-Lord think they have too good a penny-worth, he wants not power and will to make him pay more for his next Bargain.

On the other side, it is not fit that these Leases should be let at any under rate, both because they are certain, and less hazard therein, then in laying out their money any other way: and also, because the Land-Lord himself gives a dearer rate; and so would hereby be too much damnified. And after this rate you must value all other Annuities which are certain, and assured by Lands.

The next thing I shall propose to your consideration, is the rate which is to be observed in letting and selling of Houses. And herein it will be very requisite to consider of the many Casualties Houses are subject to.

As first from the Air, they are continually weather-beaten; and sometimes, by extraordinary winds and tempests, much rent and torn; so that in a short time they run to decay, if they be not continually kept in good repair.

Secondly, From the water likewise they receive continual damage, even by the ordinary showers of rain, which are subject to foke in, and rot, and spoil them, if not carefully prevented: and many times also extraordinary floods and inundations destroy them in a moment.

Thirdly, Though this destruction by water need not much be feared in many places, yet fire may be justly feared in all: which if it once get the mastery, is a merciless enemy; and this it doth too too often, and is not to be prevented by all our own care and watchfulness, proceeding many times from the carelessness of a Neighbour, or an idle servant.

Fourthly, The Earth it self, though it be their best friend, and for the most part upholds them; yet many times for the sins of the Inhabitants it trembles under them, and throws them down, or swallows them up. By this means, whole Cities are sometimes destroyed in an instant: and though this seldom happens in our Island, yet in *Queen Elizabeths* days there were three of these Earthquakes; and though, blessed be God, they did no great hurt, yet some they did in this particular.

But passing by all these petty and extraordinary Casualties, there is one more which,

which in my minde, is more to be considered than all the rest ; and that especially, if a man buy an house not for his own use and habitation, but to let it out to others. And that is , that many times a man shall meet with an ill Tenant, that will scarce pay his Rent ; and sometimes it may stand empty without a Tenant, and so bring in no profit at all ; and also hereby it runs more speedily to ruine. And this case is so much the more considerable, because it is so ordinary ; and for this very reason , an house that stands void, is not worth so much by at least a years purchase , as another house that hath a good Tenant in it ; and it is so much the worse if the house stands not in a good place, where it is like to be long without a Tenant : howsoever a year is quickly gone, and a year lost at the beginning , is worth as much as three or four afterward.

All these things, though men do what they can to prevent them , and shift them off from themselves by Fines and Leases ; yet they must needs fall either upon the Land-Lord or the Tenant, and many times fall heavy enough upon both.

For these and such like reasons, it was the usual custom , when money was at eight in the hundred, to let Leases of Houses of 21 years, for 7 years purchase. By which rec-

kon'ing (as you may see by the Tables following) they allowed about 13 in the hundred for the profit of their money to the buyers. For in the Table of 12 in the hundred, one pound yearly rent for 21 years is worth 7 pounds, 11 shillings, 2 pence which is above 7 years and an half purchase, therefore bare 7 years purchase yields more profit, and is much about 13 in the hundred.

Now if this rate of 12 or 13 *per Cent* profit were thought fit when money was at eight in the hundred; then, now money at six, such Leases may very well be let at the rate of ten in the hundred. And one pound yearly rent to continue 21 years is worth 8 pounds, 12 shillings, and 1 pence; that is, 8 years, and an half, and somewhat more purchase. And this I suppose to be the fittest rate for most ordinary houses.

But yet since some houses being new and strongly built, need little or no reparations; and others, being old and decayed, need great and costly reparations, and many times must be partly new built, since those things lie commonly upon the Tenant, the better sort of houses will be worth more, and the other less. So that the prize of all these Leases of Houses, may be reckoned

koned after the rates of 8, 9, 10, or 12, *per Cent.* as the foresaid casualty shall require.

And to conceal nothing from you in this point; the chief thing to be looked upon in this particular, is whether the yearly rent of the house be rated at such an easie rate, that the house is very well worth it, and will yield rather more than less: in this case the house may be worth a year or two years purchase more than otherwise. But if the house be rated according to its utmost value, it will be a dear pennyworth to give above the rate of 10 *per Cent.* for it.

It may perhaps be objected against this, the great cost which men are at in building of Houses, so that if Leases of them yield no better rate, those who are at the cost to build them, will scarce have five or six in the 100 for their money laid out upon them.

To this it may be replied, that Houses are things from whence the Tenant, for the most part, receiveth little or no profit, being chiefly sleeping holes to defend them from the injury of the weather; for which purpose many times less costly houses would serve the turn. And therefore whatever men may lay out upon the building and beautifying of them, for their own pleasure and accommodation, yet it will be the part
of

of every wise builder, to lay out no more thereon, then is fitting and necessary, according to the place it stands in; that the yearly rent may bring in some considerable profit, at least to the rate of eight in the hundred.

As for publick Buildings, either for strength or ornament, they are not to be measured by so private a Standard.

Also if any well-affected persons, or Corporations, having stocks of money lying by them, shall build in convenient places, in Towns wasted by fire, houses somewhat above the degree aforesaid; such men, though they receive less profit, yet they deserve more praise.

But as for those that lay out so much upon their private Houses, that many times they would be glad to sell them again for half their cost, they may thank themselves for their loss, and may well be accounted foolish Builders, that did not consider beforehand, whether their gain would countervail their Charges.

By what hath been said, you may perceive that Leases either of Land or Houses are the most profitable Tennres for the ordinary sort of men. But yet you may desire to know whether an ordinary Lease of 21 years, or a longer Lease of 40, 50, or 60 years be best.

I start this question, to lay open the error of many men, who proceed in these Bargains without sufficient knowledge in point of art. And from hence it is that one concludes that a short Lease is most profitable, which he thinks thus sufficiently proved.

Saith he, Suppose a man hath 1000 pounds to bestow upon a Lease, if he will purchase a Lease of 100 years, it will cost 13 years purchase at the least: so your 1000 pounds will buy but 77 pounds a year, which doth not amount to the Use of your money after the rate of eight in the hundred: Whereas, if you will buy a Lease of 21 years, you may have it for seven years purchase, (money being at the foresaid rate) so your 1000 pounds will purchase you a Lease of 140 pounds a year, which is 60 pounds a year more than the Use of your money will come unto. So that in the longer Lease you will lose three pounds a year, and by the shorter Lease, you will gain threescore pounds a year; more than your money will yield at Interest.

This reckoning, I confess, is true according to these erroneous rules, by which most men make their bargains: and so for want of better knowledge, oftentimes run themselves into very great damages. The chief cause

cause whereof proceeds from mens setting too low a price & value upon a short Lease and too high a price and esteem upon a long Lease, which is only for lack of Art. And perhaps men may be deceived hereby reasoning thus with themselves. If a man gives 7 years purchase for a Lease of 21 years, it is 7 years before he receives his principal money again, and then he hath but 14 years more for the increase thereof and in all the 21 years he receives his money laid out but three times over: Whereas, a man giving 13 years purchase for a Lease of 100 years; though it be 13 years before he receive his principal in again, yet then he hath 87 years of clear profit, and in the whole 100 years, receives his money laid out almost eight times over.

But this reason deceives men in considering too much of the often return of the money, and too little of the length of the time. For he that hath a Lease of 21 years, for seven years purchase, it is true, he can in that 21 years make but a threefold return of his money: but then after those 21 years he may make such another bargain for 21 years more, and so return his money three times more. And so continuing to do, in 105 years he may return his principal laid out 15 times over, ten times whereof will be clear

clear gains: whereas the other shall gain little more than half so much.

Thus you see, if you count aright, it is manifest, there is a very great disproportion between the price of the long Lease, and the price of the short Lease; which ought not to be so. For what reason is there but that a man should have as good a pennyworth in a long Lease, as in a short one; And I suppose the intent both of buyer and seller is that it should be so: but all the fault lies in those false rules and customs, which may with much right and reason be amended by Art.

The truth therefore is, the short Lease is much undervalued; and the long Lease is much over-valued. For in the short Lease, the buyer hath after 13 in the hundred allowed him for the profit of his money; whereas in the long Lease he hath not after 8. And the reason of this over-valuing the long Lease, is either for want of skill, or consideration what the money in that time, at Interest upon Interest will come to. Indeed all men have not time or skill to cast it up; and there is much want of Tables of sufficient length for this purpose, most Tables not exceeding 31 years. And this was the chief reason of my writing, and therefore I have enlarged my Tables to 100 years
apiece,

a piece : yet not all in single years, because the difference would be but small, in many of the years, and may be supplied well enough by estimation and proportion.

Now by these Tables you may plainly see, that however men may esteem of a long Lease, yet in most of these Tables, a Lease of 100 years is worth but little more than a Lease of 60 years; and a Lease of 60 years is worth but little more than a Lease of 30 years.

As for Example, in the Table of rent in the 100, the price of one pound to continue

Twenty one years is,	8. l.	12. s.	11 d.
Thirty one years,	9	9	7
Threescore years,	9	19	4
And 100 y. not full,	10	0	0

But you will say, this is very strange, and few men think so.

I grant it, but the reason hereof is, because men do not consider the profit which their money may yield them in so many years. For though it be not allowed to take rent in the hundred yearly for money; yet those who have any employment for their money otherways, may very well make at least ten in the hundred of it: and after this reckoning, one pound in 60 years will come to 300 pounds, and in 100 years to 1378 pounds; and on the other side, the Rever-

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tion of one pound 60 years hence, at this
rate, is not worth a penny, and at 100 years
hence, it is not worth the fourteenth part of
a farthing.

By this you may see there is great need
of Art, which like an equal Umpire, between
man and man, may declare the true value
of any lease for any time; so that one bar-
gain shall not be too dear, and another
too cheap, but each have a due proportion
to the time of years; and so in this respect,
there is no more advantage or profit in one
kinde of Lease more than in another. But
he that will not be ruled by Art, but will
follow these, or such like false Rules, must
(you see of necessity) either wrong himself
or others, yea, and before he is aware, may
wrong himself as soon as another, either in
buying or selling such bargains.

In answer therefore to this question; this
false conclusion and unjust practice being
taken away, so that a man may have as
good a penny-worth in a long Lease, as in a
short Lease; it will plainly appear, that a
long Lease for the most part is the best (at
least) for the Tenant. For suppose it be a
lease of Land, the Tenant having a long
Lease, may, and will strive to improve it
what he can, because he is in hopes long to
enjoy it, & receive the benefit thereof. And
all

all this will be no great hurt to the Land Lord, unless he be too greedy after great Fines, or loves alwayes to be raising his Tenants rent, and so many times as they impoverish their Tenants, their Tenants impair their Land.

Indeed for Leases of Houses the case is more difficult, for they many times cannot well stand out a long Lease; but yet a man must take such an house that will be a quire new building, either in whole or part, he had better then, have a long Lease thereof, that so he may the longer and more certainly enjoy it, after his cost and pain bestowed upon it.

On the other side, when a man hath a short Lease either of Land or an House, he dares not do what he would to improve, lest his Rent should be raised, or he run out by the greedy covetousness of his Land Lord, or the envious greediness of some evil neighbour.

If any one hath an ill bargain of the long Leases, it is the Land-Lord; and this is not so much because he shall receive few Fines, but rather by his taking too great Fines of his Tenants, and so by the Fine cut off so much the more of his yearly Revenue.

For you see that for all the money the Land

Land-Lord receives for the Fines of those Leases, he rebates his Tenant for it, not only after the rate of simple Interest, but at Interest upon Interest, at six, eight, or ten in the hundred, which you see increaseth so fast in 50 or 60 years, that it eats out almost all the principal Rent, and makes the latter half of the years to increase so little in value.

It is the best way therefore, for Land-Lords, in these Leases, not to take over great Fines, but such as may be only sufficient to binde their Tenants to keep to their bargains, and make them careful to perform their Covenants, lest they forfeit their Leases, and lose their Fines. And this is the best and most politick end of these manner of Fines. And this will be best for the Tenant, and no hurt to the Land-Lord.

THere is one question more about the buying of Houses, and that is, that if such long Leases of them do yield no more, what may be the value of them to buy them out right?

To judge the better of this, you must consider the strength and goodnesse of the house, and the Materials of which it is built; whether Timber, Brick, or Stone; In which respects some houses are able to stand

stand many scores (if not some hundred of years more than others, and when comes to be pull'd down, these materials may be worth somewhat, or serve to the new building thereof again. Now he hath only a Lease (though it be a long Lease) yet he hath none of this profit, but is bound to be at charge to uphold and maintain it in good order as it was delivered to him.

Again, suppose these things are little worth, yet the very space and quantity of ground whereon the house stands, may in many places be very considerable, inasmuch that it is ordinary for men to build upon a Lease of 31 years, and yet pay a good reasonable Rent to their Land-Lord besides. Upon these accounts, the purchase of an house out-right, may well be worth two or three years purchase, more than a Lease of an hundred years. So that though the Leases be not worth above 10 years purchase: yet the Fee-simple of an house may be worth 12 or 13 years purchase.

THere is another thing somewhat considerable in the buying of Land and Houses, and that is the Taxes which for the present lie heavy upon them. But this I hope by Gods blessing in a short time will be ta-

ken

ken off, so that it will be needless to give any rules about it. Yet to satisfy men in this, I shall set down this rule briefly First, the taxes being known what they come to yearly, may be subtracted from the outmost yearly value of the Land or House; and so what remains, you may safely purchase according to the rules aforesaid.

Yet since they may be taken off in good time, I would wish no man to be over-hasty to sell thus; but at least to divide the burthen of these Taxes, between his Customer and himself.

THere is another way of purchasing Land or Houses, by buying Lives therein, and this is the ordinary rule for it. One life in any thing is accounted of equal worth to a Lease of seven years. Two Lives are worth as much as a Lease of 14 years. Three lives are worth as much as a Lease of 21 years. And so still increasing by seven years for every Life.

But this way of reckoning seems to me somewhat unequal, since one or two may live as long as eight or ten, why should there be so great a difference accounted? I confess a mans life is very uncertain, and therefore I would wish every one to take heed how they deal in such a way of purchasing:

chasing: but yet considering on the one side, that by this means one is provided for as long as he lives, and when he is dead he need take no care: and on the other side that if he be any thing young, or likely to live at all, he may live 20 or 30 years, what reason is there that the seller should be at so much hazard, as to venture 30 years for a single life.

Again, though two are better than one, and *A threefold Cord is not easily broken*, yet it is not altogether so in mens lives, but many times three or four may die sooner than one, herein the Buyer runs some hazard, which though with more reason than the Seller before, yet it is fit he should have some consideration for it.

Therefore in my minde it were more equal, if a single life were rated as a Lease of 12 years, or ten at the least, and so for any more lives to decrease one year for every life. And so they will be worth, as in the little Table.

1		12	10
2		23	19
3		33	27
4	Lives are of equal worth to a Lease of these Years, accor- ding to the foresaid Rules and Tables.	42	34
5		50	40
6		57	Or 45
7		63	49
8		68	52
9		72	54
10		75	55
11		77	
12		78	

Thus much for these pre-considerations:
I shall now set the Tables before you, shew-
ing you the true value of any thing accor-
ding to the true Rules and Rates.

But in the first place, I shall set before
you the manner of the construction and cal-
culation of these tables, that so I may leave
no just exceptions against what I have said
or shall say in this point.

The best and most artificial way to make
these Tables, is to finde certain numbers in
continual proportion decreasing, according
to the rate of the Interest propounded,
which numbers may shew the true worth of
one pound principal at the end of any num-
ber of years. And then by addition of all
these numbers one to the others, the fore-
said

said Table of Purchases from year to year produced, which because they come out in *Decimals* of pounds, you may afterwards reduce into pounds, shillings, and pence.

Thus let the rate of the Interest be 6 in the 100, these numbers will be thus found.

As 106 l. to 100 : So 1 l. to 0,9434

You may increase these fractions as you will for the more exactness. As thus much is 1 pound worth at the end of one year.

Then for the second year,

As 106, to 100 : So 9434. to 8900, which is the worth of one pound at the end of two years, so these two added together make 1,8334, which is the worth of one pound Annuity to continue two years.

So again do for the third year.

As 106 to 100 ; so, 8900, to 8396, which added to the former makes 2,6730, which is the value of three years.

And so you must do for every other year as long as you make your Table for.

As you may see by this short Table of years at 6 in the hundred.

*The decrease,
or worth of
the Reversi-
on.*

*The worth of
the Pur-
ch. se by
Addition.*

1	9134	0,9134
2	8900	1,8334
3	8396	2,6730
4	7921	3,4651
5	7472	4,2123
6	7050	4,9173
7	6651	5,584

Thus there is nothing difficult, but only the reducing of their numbers into the more known value of pounds, shillings, and pence, which may be performed by this Table.

Note that I have abreviated this Table to four places, considering this will be sufficient exactness, shewing the true value of one pound to the tenth part of a farthing; and it is so much more easie in many other propositions, which I have shewed to be wrought thereby. Also to make it more ready for you, I have set down the fractions from a farthing to a shilling in single farthings:

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A Table of Decimal Fractions, shewing the proportion of any number of Shillings, Pence, or Farthings to a pound; the pound being divided into 10000 parts.

Shillings	parts.	d.	q.	parts.	d.	q.	parts.
19	9500	11	3	0490	5	3	0240
18	9000	11	2	0479	5	2	0229
17	8500	11	1	0469	5	1	0219
16	8000	11	0	0458	5	0	0208
15	7500	10	3	0448	4	3	0198
14	7000	10	2	0437	4	2	0188
13	6500	10	1	0427	4	1	0177
12	6000	10	0	0417	4	0	0167
11	5500	9	3	0406	3	3	0156
10	5000	9	2	0396	3	2	0146
9	4500	9	1	0385	3	1	0135
8	4000	9	0	0375	3	0	0125
7	3500	8	3	0365	2	3	0115
6	3000	8	2	0354	2	2	0104
5	2500	8	1	0344	2	1	0094
4	2000	8	0	0333	2	0	0083
3	1500	7	3	0323	1	3	0073
2	1000	7	2	0312	1	2	0063
1	0500	7	1	0302	1	1	0052
		7	0	0292	1	0	0042
		6	3	0281	0	3	0031
		6	2	0271	0	2	0021
		6	1	0260	0	1	0010
		6	0	0250	0	0	0000

Or if you like not these decimal Fractions, you may reduce the one pound into pence, or farthings, and work as before. Thus if in pence. 44

As 106 l. to 100 l. so 240 d. to 226 d. 106

Which reduced into shillings and pence, is 18 shillings, 10 pence, 2 farthings, *feré*.

Or if you reduce the 20 shillings into farthings, 70

As 109 l. to 100 l. so 960 q. to 905 q. 100

Which reduced, is as before 18 shillings, 10 pence, 2 farthings, *feré*.

But in this if you proceed to make the Table for many years, you must have some respect to the fraction left, which is best by adding a cypher or two to the Dividend, and so they will come into tens or hundred parts of a penny or farthing.

Now these Tables of Reversion being added together, make up the Tables of purchase. But I have not expressed these Tables of Reversion; because I have made little use of them, only in making the other Tables. If any would make use of them, or any part of them, they may easily take them out of the Tables of purchase by Subtraction, as I shall shew in its place.

But because this way of calculating these Tables, is very tedious, and subject to error, by reason of the many divisions and

additions, if there be not great care had therein; and one fault herein may produce many: those who have skill in the use of Logarithms may thereby finde out the true value of any thing for any number of years, without respect had to the former years, which will be a shorter way, and serve as a proof to the Tables, in case of any doubt.

As now for example.

Let it be required to know the true value of a Lease of Land to continue seven years after the rate of six in the hundred.

First, take the Logarithm of 100, from the Logarithme of 100, and the rate of Interest added together, which in this Example is 106.

Secondly, multiply this Logarithm by the number of years, which in this Example is 7.

Thirdly, divide 100 by the rate of the Interest, which is 6, and it will produce 16, 6667; then take the Logarithm hereof, and adde it to the former Logarithme, the product whereof will yield the Logarithm of the Arrearages with the said summe for that time.

Fourthly, finde out the true number of these Arrearages, & out of them subtract the proportional part of 100 before found, according to the rate of the Interest; so you shall

shall have the bare Arrearages for that proportional part.

Lastly, take the Logarithm of these last Arrearages, and subtract from them the Logarithm found by the multiplication of the years (in the second rule) so you shall have the Logarithm of the true value of these Arrearages in ready money; the true number whereof being found out, and reduced into pounds, shillings, and pence, may be used as any number in the Tables.

Logarithm of 106 2,0253058

Logarithm of 100 2,0000000

Rests by Subtraction 0,0253058

Which multiplied by 7 7

Comes to 0,1771406

Adde the Logar. of 16,6667 1,2218287

Yields 1,3989893

This is the Logarithm of

25,0605

From which 16,6667 subtracted,

Rests 08,3938

The Logarithm of 8,3938 0,9239595

Log. by Multiplication of } 0,1771406

Years subtracted } 2

Rests 0,7468139

Which is the logarithm of 5,5824, which reduced, as in the little Table aforesaid, is 5 pounds, 11 shillings, 7 pence, 3 farthings, and somewhat more, which I have set down in my Table, 5 pounds, 11 shillings, 8 pence, not accounting any Fractions under a penny.

Several Tables shewing the true value of one pound yearly Rent to continue any number of years under 31, and from thence to 100 years, increasing by every tenth Year, after the Rates of 5, 6, 7, 8, 9, 10, and 12. in the hundred, reckoning Interest upon Interest.

The number of years to be purchased.

1000000
1000000
1000000
1000000

1000000
1000000
1000000
1000000

Purchase of Annuities at 5 per Centum.

l. sh. d.			l. sh. d.		
<i>The number of years to be purchased.</i>	1	0	19	00	
	2	1	17	01	
	3	2	14	05	
	4	3	10	11	
	5	4	06	07	
	6	5	01	06	
	7	5	15	09	
	8	6	09	03	
	9	7	02	01	
	10	7	14	03	
	11	8	06	01	
	12	8	17	03	
	13	9	07	11	
	14	9	18	00	
	15	10	07	08	
	16	0	16	09	
	17	1	05	06	
	18	1	13	10	
	19	1	20	09	
	20	1	20	09	
	21	1	21	05	
			22	13	03 03
			23	13	09 10
			24	13	16 00
			25	14	01 11
			26	14	07 06
			27	14	12 11
			28	14	18 00
			29	15	02 10
			30	15	07 05
			31	15	12 00
			<i>In tens of years.</i>		
			40	17	02 05
			50	18	05 01
			60	18	18 02
			70	19	06 10
			80	19	11 11
			90	19	15 00
			100	19	16 00

The worth of one pound Annuity.

The number of years to be purchased.

The worth of one pound Annuity.

Purchase of Annuities at 6 per Centum.

li. sh. d.			li. sh. d.		
<i>The number of years to be purchased.</i>	1	0 18 10	<i>The worth of one pound Annuity.</i>	22	12 00 10
	2	1 16 08		23	12 06 01
	3	2 13 06		24	12 11 00
	4	3 09 04		25	12 15 08
	5	4 04 03		26	13 00 01
	6	4 18 04		27	13 04 03
	7	5 11 08		28	13 08 01
	8	6 04 02		29	13 11 10
	9	6 16 00		30	13 15 04
	10	7 07 02		31	13 18 07
	11	7 17 09	<i>The number of years to be purchased.</i>	<i>In tens of year,</i>	
	12	8 07 02		40	15 00 08
	13	8 17 01		50	15 14 06
	14	9 05 11		60	16 03 03
	15	9 14 03		70	16 07 08
	16	10 02 01		80	16 10 02
	17	10 09 07		90	16 11 07
	18	10 16 07		100	16 12 04
	19	11 03 02			
	20	11 09 05			
	21	11 15 03			

The worth of one pound Annuity.

The number of years to be purchased.

Purchase of Annuities at 7 per Centum.

li. sh. d.			li. sh. d.		
<i>The number of years to be purchased.</i>	1	0 18 08	<i>The number of years to be purchased.</i>	22	11 01 3
	2	1 16 02		23	11 05 5
	3	2 12 06		24	11 09 5
	4	3 07 09		25	11 13 1
	5	4 12 00		26	11 16 6
	6	4 15 04		27	11 19 6
	7	5 07 09		28	12 02 9
	8	5 19 05		29	12 05 7
	9	6 10 04		30	12 08 2
	10	7 00 06		31	12 10 8
	11	7 10 00		<i>In tens of years.</i>	
	12	7 18 10		40	13 06 7
	13	8 07 02		50	13 15 8
	14	8 14 11		60	14 00 9
	15	9 02 02		70	14 03 2
	16	9 08 11		80	14 04 5
	17	9 15 03		90	14 05 1
	18	10 01 02		100	14 05 5
	19	10 06 08			
	20	10 11 11			
	21	10 16 08			

Purchase of Annuities at 8 per Centum.

li. sh. d.				li. sh. d.							
<i>The number of years to be purchased.</i>				<i>The worth of one pound Annuity.</i>				1	0	18	06
								2	1	15	08
								3	2	11	06
								4	3	06	03
								5	3	19	10
								6	4	12	05
								7	5	04	01
								8	5	14	11
								9	6	04	11
								10	6	14	02
								11	7	02	09
								12	7	10	08
								13	7	18	01
								14	8	04	10
								15	8	11	02
								16	8	17	00
								17	9	02	05
								18	9	07	05
								19	9	12	01
								20	9	16	04
								21	10	00	04
<i>The number of years to be purchased.</i>				<i>In tens of years.</i>				22	10	04	1
								23	10	07	5
								24	10	10	7
								25	10	13	6
								26	10	16	3
								27	10	18	9
								28	11	01	0
								29	11	03	2
								30	11	05	2
								31	11	07	0
								<i>The number of years to be purchased.</i>			
50	12	04	08								
60	12	07	06								
70	12	08	10								
80	12	09	06								
90	12	09	09								
100	12	09	11								

The worth of one pound Annuity.

The worth of one pound Annuity.

The number of years to be purchased.

Purchase of Annuities at 9 per Centum.

li. sh. d.			li. sh. d.		
<i>The number of years to be purchased.</i>	1	0 18 04	<i>The number of years to be purchased.</i>	22	9 08 17
	2	1 15 02		23	9 11 7
	3	2 10 08		24	9 14 2
	4	3 04 09		25	9 16 6
	5	3 17 09		26	9 18 7
	6	4 09 09		27	10 00 6
	7	5 00 08		28	10 02 4
	8	5 10 08		29	10 04 0
	9	5 19 11		30	10 05 6
	10	6 08 04		31	10 06 10
	11	6 16 01	<i>Intens of years</i>		
	12	7 03 02			
	13	7 09 09			
	14	7 15 29	<i>The number of years to be purchased.</i>	40	10 15 02
	15	8 01 03		50	10 19 03
	16	8 06 03		60	11 00 10
	17	8 10 11		70	11 08 08
	18	8 15 01		80	11 02 00
	19	8 19 00		90	11 01 01
	20	9 02 07		100	11 01 02
	21	9 05 01			

The worth of one pound Annuity.

The worth of one pound Annuity.

Purchase of Annuities at 10 per Centum.

l. sh. d.				l. sh. d.											
<i>The number of years to be purchased.</i>				<i>The worth of one pound Annuity.</i>				22	8	15	5				
								23	8	17	7				
								24	8	19	8				
								25	9	01	6				
								26	9	03	2				
								27	9	04	8				
								28	9	06	1				
								29	9	07	4				
								30	9	08	6				
								31	9	09	7				
												<i>In tens of years.</i>			
								40	9	15	07				
								50	9	18	04				
								60	9	19	04				
								70	9	19	09				
								80	9	19	11				
								90	9	19	11				
								100	10	00	00				

Pu

The number of years to be purchased.

Purchase of Annuities at 12 per Centum

l. sh. d.

l. sh. d.

The number of years to be purchased.

1	0	17	10
2	1	13	10
3	2	08	00
4	3	00	09
5	3	13	01
6	4	02	03
7	4	11	03
8	4	19	04
9	5	06	06
10	5	13	00
11	5	18	09
12	6	03	10
13	6	08	05
14	6	12	06
15	6	16	02
16	6	19	05
17	7	02	04
18	7	04	11
19	7	07	03
20	7	09	04
21	7	11	02

The worth of one pound Annuity.

The number of years to be purchased.

22	7	12	10
23	7	14	04
24	7	15	08
25	7	16	10
26	7	17	10
27	7	18	10
28	7	19	08
29	8	00	05
30	8	01	01
31	8	01	08

In tens of years.

40	8	04	10
50	8	06	00
61	8	06	06
70	8	06	07
80	8	06	08
90			
100			

The worth of one pound Annuity.

The use of these Tables.

First, to know the price of any Annuity, to continue any number of Years.

HAVING, according to the former observations, considered the nature of the thing you intend to buy, and so found out after what profit you may fitly lay out your money upon it, whether at 5, 6, 7, 8, 9, or 10 in the hundred, according to the certainty or uncertainty of the thing: then to call up what the value of the purchase will be according to that rate, you must do thus.

First, finde the rate of the gain you would have for your money at the head of the Table, and finde the years of the continuance of the Lease or Annuity on the side of the Table, and in that line under the foresaid rate, you shall finde what the purchase of one pound a year, to continue the said number of years is worth; by which, with a little addition, you may find the true value of any other prized yearly income; whether it be little or great.

As for Example.

What is a Lease of ten pounds yearly value, to continue 21 years, worth in ready money

money, after the rate of six in the hundred Interest.

By that Table you see that one pound a year to continue 21 years, after the said rate of six for the hundred, is worth 11 pound, 15 shillings, 3 pence. So then ten pound a year is worth ten times as much which may be thus easily found.

Ten times 11 pound is	110l. 00s. 00d.
Ten times 15 shillings is	007 10 00
Ten times 3 pence is	000 02 06
	<hr/>
	117 12 06

In all

Which is the value of the thing desired.
The like you may do by any other prized Annuity for any other time, and at any other rate of profit for your money, as the nature of the thing requires.

Thus the Lease of an house for 21 years, being reckoned by the Table of 10 pound per Cent. for one pound or 20 shillings Annuity is worth 8 pound, 12 shillings, 11 pence; therefore 10 pound per Annum is worth ten times as much, which you may reckon as before,

Ten times 8 pound is	80 0 0
Ten times 12 shillings is	06 0 0
Ten times 11 pence is	00 9 2
	<hr/>

In all

86 9 2
Which

Which is the value of the said Lease:

But because men usually reckon bargains of this nature by the yearly revenue of the thing, and use to say, such a thing is worth so many years purchase; this may also plainly and truly be done by the foresaid Tables: and though this way cannot be so exact as the other, yet for custome sake take it thus.

The Tables are exactly cast up for one pound yearly revenue, at each of the said rates, so that in the sums set down therein, for every pound or 20 shillings you must reckon one years purchase; for ten shillings, half a years purchase, for five shillings, a quarter of a years purchase; and so for any summe under, proportionally.

But because I would make things as plain as I could to every one, I have here reduced some of the most necessary Tables aforesaid into years, and parts of a year, dividing the year into 12 parts, or months, which will be exact enough in most bargains.

yearly
purchase

This Table is fit to be used only in the purchase of Free-Hold Land,

Tables of purchasing.

At 5 per Cent. | At 6 per Cent.
 year to be the value in year to be the value in
 purchas. year.moneth. purchas. year.moneth.

This Table is fit to be used only in the purchase of Free-Hold Lands	1	0	11	1	0	11
	2	1	10	2	1	10
	3	2	9	3	2	8
	4	3	7	4	3	6
	5	4	4	5	4	3
	6	5	1	6	4	11
	7	5	9	7	5	7
	8	6	6	8	6	2
	9	7	1	9	6	10
	10	7	9	10	7	4
	11	8	4	11	7	11
	13	9	5	13	8	10
	15	10	5	15	9	9
	17	11	3	17	10	6
	19	12	1	19	11	2
	21	12	10	21	11	9
	23	13	6	23	12	4
	25	14	1	25	12	9
	27	14	8	27	13	3
	29	15	2	29	13	7
	31	15	7	31	13	11
This Table may be used in the purchase of Coppy-Hold Lands, or in Leases of Land.	41	17	1	41	15	1
	51	18	3	51	15	9
	61	18	11	61	16	2
	71	19	4	71	16	5
	81	19	7	81	16	6
	91	19	9	91	16	7
	Fee simp.	20	0	Fee simp.	16	8

Tables of purchasing.

At 8 per Cent.			At 10 per Cent.		
year to be purchas.	the value in year.moneth		year to be purchas	the value in year.moneth	
1	0	11	1	0	11
2	1	9	2	1	10
3	2	7	3	2	9
4	3	4	4	3	8
5	4	0	5	3	7
6	4	7	6	4	6
7	5	2	7	4	5
8	5	9	8	5	4
9	6	3	9	5	3
10	6	9	10	6	2
11	7	2	11	6	1
13	7	11	13	7	0
15	8	7	15	7	9
17	9	1	17	8	8
19	9	7	19	8	7
21	10	0	21	8	6
23	10	4	23	9	5
25	10	8	25	9	4
27	10	11	27	9	3
29	11	2	29	9	2
31	11	4	31	9	1
41	11	11	41	9	0
51	12	3	51	9	9
61	12	4	61	10	8
71	12	5	71	10	7
81	12	6	81	10	6
91	12	6	91	10	5
Fee simp	12	6	Fee simp	10	4

This Table may be used in the purchases of Leases of Lands, and of some Houses.

This Table is fittest to be used in the purchasing of Leases of Houses.

Thus the former question being demanded, you shall finde by these Tables, that a Lease of 21 years reckoned after the rate of 6 per Cent. is worth 11 years and nine moneths, or 3 quarters of a years purchase. So that the yearly rent of the thing being 10 l. the value will be thus found.

Eleven times 10 l. is 110 l. 00 00

3 quarters of 10 l. is 7 10 00

In all 117 10 00

And this is very near the former price, and though not altogether so exact, yet will serve in most bargains of this nature.

Though either of these ways be exact enough for most men, and most questions of this nature; yet if any desire to be more exact, they will finde some trouble, when either the Annuity or the numbers in these Tables, do not make even ponnies, or at least common and known parts of a pound. In this case therefore, if you will be curious to know the precise value, you must have recourse to the table of Decimal Fractions, page 26. and thereby reduce both the price of the Annuity, and the price of the purchase thereof set down in these tables, into those fractions, and so multiplying one by the other, and reducing the product thereof

(44)

of again by the said Decimal Table, you shall have the true value or the purchase exactly.

Thus, let the Annuity be worth 55 pound 12 shillings, 6 pence, and you desire to know the value thereof for 21 years at the rate of six per Centum.

This Annuity reduced by the Decimal Table, will be 55 l, 6250 p. and the Table shews the worth of one pound for 21 years is 11 pound, 15 shillings, 3 pence, which reduced likewise, is 11 l. 7625 p. now these two must be multiplied each by other, to which purpose let these two numbers thus,

$$\begin{array}{r} 11.7625 \\ 55.6250 \\ \hline 5881250 \\ 235250 \\ 705750 \\ 588125 \\ 521785 \\ \hline 6542890-6257 \end{array}$$

All the difficulty now is in finding out the value of this product. Therefore observe first, that all the figures which are beyond the pounds, or Integers in the Multiplica-

ror, are separated by the point (.) to distinguish them; and under this point there must be a perpendicular line drawn to cut off all the figures under them as useless.

Then from this last account four figures more in the product, according to the places of the decimal Table) and there make a prick at 4. so the product appears to be: 654 l. 2890. that is, 654 pound, 5 shillings, 9 pence, 2 farthings.

Or else to be more sure, cast it up a near as you can the former way; and so you shall see whether 2, 3, or 4 of the first figures of the product stand for pounds, and the four next take for the Fractions.

Some yet more curious, would have these Tables calculated, not only to shew the value of purchases in whole years (as the former Tables do) but for every three months. And though the difference will not be great, yet there is some reason for it, for the Rent of Land or Houses being paid every quarter or half year, the buyer hath the benefit of the first quarters rent, for three quarters of a year; of the second quarters rent, for half a year, and of the third quarters rent, for a quarter of a year, all which the Seller loseth, in selling by the former Tables.

Therefore, as I have for the use of the common sort of men, made the former Tables

bles as plain as I could, not having respect
to this exactness, because no man is to
make his bargain exactly according
to these Rules, but only to learn hereby
what rate of profit he buyes or sells: for
the satisfaction of those who are more skil-
ful, I have calculated these two Tables
shewing what one pound yearly rent to be
paid quarterly is worth, any term of years
or quarters under 21 years, the one at 6
Cent. the other at 8 per Cent. these two being
the most necessary in this case, and by which
you may have some guess of the other
rates.

The are	
years	quar
0	1
	2
	3
1	0
	1
	2
	3
2	0
	1
	2
	3
3	0
	1
	2
	3
4	0
	1
	2
	3
5	0
	1
	2
	3
6	0
	1
	2
	3
7	0

The value of the purchase of Annuities which
are to be paid every 3 months at 6 per Cent.

years	quar.	y. par. or li. parts.	years	quar.	y. par. or li. parts.	years	quar.	y. par. or li. parts.
0	1	0,2463	7	1	5,8439	14	1	9,5332
		2 0,4890		2	6,0039		2	9,6387
		3 0,7280		3	6,1614		3	9,7425
1	0	0,9636	8	0	6,3167	15	0	9,8448
		1 1,1956		1	6,4696		1	9,9456
		2 1,4243		2	6,6203		2	10,0449
		3 1,6495		3	6,7688		3	10,1428
2	0	1,8715	9	0	6,9150	16	0	10,2392
		1 2,0901		1	7,0592		1	10,3342
		2 2,3055		2	7,2011		2	10,4277
		3 2,5177		3	7,3410		3	10,5199
3	0	2,7268	10	0	7,4788	17	0	10,6108
		1 2,9328		1	7,6146		1	10,7002
		2 3,1358		2	7,7484		2	10,7884
		3 3,3358		3	7,8802		3	10,8753
4	0	3,5328	11	0	8,0100	18	0	10,9608
		1 3,7269		1	8,1379		1	11,0452
		2 3,9181		2	8,2640		2	11,1282
		3 4,1065		3	8,3881		3	11,2100
5	0	4,2921	12	0	8,5105	19	0	11,2977
		1 4,4750		1	8,6310		1	11,3701
		2 4,6551		2	8,7497		2	11,4484
		3 4,8327		3	8,8667		3	11,5255
6	0	5,0075	13	0	8,9810	20	0	11,6014
		1 5,1798		1	9,09		1	11,6763
		2 5,3496		2	9,2074		2	11,7500
		3 5,5168		3	9,3177		3	11,8227
7	0	5,6816	14	0	9,4262	21	0	11,8942

bles as plain as I could, not having respect
to this exactness, because no man is to
to make his bargain exactly according
these Rules, but only to learn hereby
what rate of profit he buyes or sells : for
the satisfaction of those who are more skil-
ful, I have calculated these two Tables
shewing what one pound yearly rent to
paid quarterly is worth, any term of years
or quarters under 21 years, the one at 6
Cent. the other at 8 per Cent. these two being
the most necessary in this case, and by which
you may have some guess of the other
rates.

The
areyears
quarters

1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
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40	40
41	41
42	42
43	43
44	44
45	45
46	46
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48	48
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67	67
68	68
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72	72
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75	75
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77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

The value of the purchase of Annuities which
are to be paid every 3 months at 6 per Cent.

years	quar.	y. par. or li. parts.	years	quar.	y. par. or li. parts.	years	quar.	y. par. or li. parts.
0		10,2463	7		15,8439	14	1	9,5332
		20,4890			26,0039		2	9,6387
		30,7280			36,1614		3	9,7425
1		00,9636	8		06,3167	15	0	9,8448
		11,1956			16,4696		1	9,9456
		21,4243			26,6203		2	10,0449
		31,6495			36,7688		3	10,1428
2		01,8715	9		06,9150	16	0	10,2392
		12,0901			17,0592		1	10,3342
		22,3055			27,2011		2	10,4277
		32,5177			37,3410		3	10,5199
3		02,7268	10		07,4788	17	0	10,6108
		12,9328			17,6146		1	10,7002
		23,1358			27,7484		2	10,7884
		33,3358			37,8802		3	10,8753
4		03,5328	11		08,0100	18	0	10,9608
		13,7269			18,1379		1	11,0452
		23,9181			28,2640		2	11,1281
		34,1065			38,3881		3	11,2100
5		04,2921	12		08,5105	19	0	11,2917
		14,4750			18,6310		1	11,3701
		24,6551			28,7497		2	11,4484
		34,8327			38,8667		3	11,5255
6		05,0075	13		08,9810	20	0	11,6014
		15,1798			19,09		1	11,6763
		25,3496			29,2074		2	11,7500
		35,5168			39,3177		3	11,8227
7		05,6816	14		09,4262	21	0	11,8942

The value of the purchase of Annuities which
are to be paid every 2 months at 8 per cent.

years	quar.	y. par. or li. parts.	years	quar.	y. par. or li. parts.	years	quar.	y. par. or li. parts.
0	1	3,2452	7	1	5,5031	14	1	8,5711
	2	0,4858		2	5,6435		2	8,6530
	3	0,7218		3	5,7812		3	8,7333
1	0	0,9532	8	0	5,9163	15	0	8,8121
	1	1,1796		1	6,0487		1	8,8894
	2	1,4031		2	6,1787		2	8,9653
	3	1,6216		3	6,3062		3	9,0398
2	0	1,8359	9	0	6,4313	16	0	9,1126
	1	2,0461		1	6,5539		1	9,1842
	2	2,2524		2	6,6743		2	9,2544
	3	2,4547		3	6,7923		3	9,3244
3	0	2,6531	10	0	6,9081	17	0	9,3909
	1	2,8478		1	7,0216		1	9,4572
	2	3,0388		2	7,1334		2	9,5223
	3	3,2261		3	7,2425		3	9,5859
4	0	3,4099	11	0	7,3492	18	0	9,6485
	1	3,5901		1	7,4546		1	9,7099
	2	3,7669		2	7,5580		2	9,7701
	3	3,9404		3	7,6592		3	9,8291
5	0	4,1105	12	0	7,7585	19	0	9,8871
	1	4,2775		1	7,8584		1	9,9439
	2	4,4412		2	7,9514		2	9,9996
	3	4,6018		3	8,0451		3	10,0543
6	0	4,7593	13	0	8,1371	20	0	10,1079
	1	4,9139		1	8,2272		1	10,1606
	2	5,0654		2	8,3157		2	10,2122
	3	5,2127		3	8,4025		3	10,2626
7	0	5,3600	14	0	8,4875	21	0	10,3125

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The use of these Tables is the same with the former, only this for the more ready and exact use is cast up in pounds, and decimal parts of pounds, which you may reduce by the decimal Table, page 26.

For Example.

If you would know the value of the foresaid Lease of ten pounds a year, to continue twenty one years, and to be received quarterly, after the rate of 6 l. per Cent. you shall finde by this Table that,

One pound yearly for 21 years is worth	li. parts.
This multiplied by 10. the Rent of the purchase being 10 li. per Annum, makes which reduced by the decimal Table is	11 8 42
Where as the price by the former Table, page 32 was found to be	11 8 94 20
The difference being	li. sh. d. 11 8 18 10
	117 12 06
	001 06 04

There is another very necessary question easily resolved by these Tables, and that is, when any one doth ask of you such a summe of money, or so many years purchase for a parcel of Land, Lease, or House, to know what profit he allows you for your money.

E

As

As now, Suppose you may have a Lease of an house for 21 years, for 8 years, and an half purchase, what profit doth your money yield you?

For this purpose; first, you must finde the number of years in the sides of the Tables, and look in the several Tables until you finde the same summe demanded, or the nearest you can finde to it, then at the head of that Table, you shall finde the rate of the profit which your money brings you in.

Thus, if according to this example, you look over all the Tables, for eight years and an half purchase, that is 8 pounds, 10 shillings in the line of 21 years, you shall finde in the Table of 10 per Centum, at 21 years 8 pounds, 12 shillings, 11 pence; which is the nearest summe that is to be found in all the Tables; and at the head of this Table you shall finde, your money brings you in by this Bargain 10 in the hundred profit.

All this which hath been spoken of purchase of Leases, you may apply to Fines for the abatement of a greater or lesser part of the Rent of any thing.

Thus, if a Tenant would have 5, 10, or 20 pounds abated in his yearly Rent, it may be reckoned worth so many years purchase as the Tables shew for.

But now suppose a Land-Lord demand an 100 pound fine for the Lease of an House for 21 years, besides the yearly Rent. I would know how much yearly Rent this 100 pound doth countervalue after the rate of 10 in the hundred.

In this case, you must take the summe set down in the Table, which for this example is 8 pounds, 12 shillings, 11 pence, and finde how many times it is contained in an 100 pound; for so many pounds of yearly Rent it countervalues.

Now this you may do by reducing the said 8 pound, 12 shillings, 11 pence into pence; so it is 2075 pence. Likewise in an 100 pound are 2400; this divided by the foresaid 2075, yields 11 in the quotient, and there remains $\frac{1175}{2075}$ which is somewhat more then an half; so that is above 11 pound, 10 shillings.

If you will know this more exactly, multiply 1175 parts of a pound by 20, so you have 23500, which divided by the former number 2075, yields 11 shillings in the quotient, and 675 remaining.

Again, if you multiply this 675 by 12, it yields 8100, which divided by 2075, yields almost 4 pence, wanting only half a farthing.

So that this 100 pound fine should coun-

tervalue according to this rate, 11 pound, 11 shillings 4 pence *feré* of yearly Rent.

Or you may have recourse to the Table of Reduction, page 26. and thereby reduce the Summe into tenths of pounds.

Thus the said 8 pounds, 12 shillings, 11 pence reduced, is 8 pound, 6458. with this divide the price of your Fine, an 100 pound, adding some cyphers thereto, as need shall be So in this Example, the Fine being 100 pound, you shall find, 11 pound 566. that is, 11 pounds, 11 shillings, 4 pence *feré*; and so much yearly Rent doth an 100 pound Fine countervalue at the rate of ten pound in the hundred for 21 years.

Lastly, you may see by the latter end of the Tables, what rate of profit your money yields you, buying any thing out-right at any number of years purchase. Thus, at ten years purchase, your money yields you 10 *per Centum* profit, as you may see by that Table. At 12 years and an half purchase for the Fee-simple, your money yields you 8 *per Centum* profit, as you may see by the end of the Table of 8 *per Centum*. And at 20 years purchase your money yields you but 5 *per Centum* profit.

And if you would know this more exactly, take this Rule, divide an 100 by the number of years, the quotient will shew you the

the Rate of the profit you have for your money.

Thus 100 divided by 12 years, the price of the purchase of the Fee-simple, yields 8, 3333, or 8 pound, 6 shillings 8 pence for the rate of the profit.

So 100 divided by 18 years, yields 5555 which is 5 pound, 11 shillings, 11 pence for the rate of your profit.

Or else if you divide an 100 by the rate of the profit you look to have, in the buying of your purchase, you may see how many years purchase you may fully give for it.

Thus, divide an 100 by 6, if that be the rate of the profit you desire in your purchase, and you shall finde 16 years and two thirds of a year, so many years purchase you may give, and yet make 6 in the hundred profit of your money.

By this a man having bought Land or Houses at any price, he may know which of the foresaid Tables he must use in the letting Leases thereof again, that he save or get by the Bargain, as he shall think fit; or at least may know whether he gets or loses by the Leases he lets.

Of Reversions.

THus much for buying any thing which is presently to be possessed.

There are other kind of purchases in Reversion, when the thing yields no profit for the present, till some considerable term of years be passed.

And in these bargains you must also look first into the quality of the thing, and the certainty thereof; and accordingly seek out the value thereof, at a greater or lesser rate of Interest.

And to this purpose I have set down these tables of Reversions to the several rates of Interest aforesaid; for though they are included in the other, yet I thought it somewhat more plain, thus to extract them for your more ready use. And I have contracted them into as small a compass as I can, yet so as they will be plain enough, considering what hath been said before, these being to be used after the same manner.

These Tables shew how much one pound or 20 s. to be paid or received, any number of years hereafter, is worth at the present time in ready money, after the several rates of 5, 6, 8, 10, and 12, per Cent.

Tables

Tables of Reversions.

	V	VI	VIII	X	XII
	per C.	per C.	per C.	per C.	per C.
	lh. d.	lh. d.	lh. d.	lh. d.	lh. d.
1	12 00	18 10	18 06	18 02	17 10
2	18 02	17 09	17 01	16 06	16 00
3	17 03	16 09	15 10	15 00	14 02
4	16 06	15 10	14 08	13 08	12 09
5	15 08	14 11	13 07	12 05	11 04
6	14 11	14 01	12 07	11 04	10 02
7	14 03	13 04	11 08	10 03	9 00
8	13 06	12 06	10 09	9 04	8 01
9	12 11	11 10	10 00	8 06	7 02
10	12 01	11 02	9 04	7 08	6 06
11	11 11	10 07	8 06	6 11	5 09
12	11 01	9 11	7 11	6 06	5 01
13	10 08	9 05	7 04	5 09	4 07
14	10 01	8 18	6 09	5 04	4 01
15	9 08	8 04	6 03	4 09	3 08
16	9 01	7 10	5 10	4 04	3 03
17	8 09	7 06	5 04	4 00	2 11
18	8 04	7 00	5 00	3 07	2 07
19	7 11	6 07	4 07	3 03	2 04
20	7 06	6 03	4 03	3 00	2 01
21	7 02	5 10	3 11	2 09	1 10
22	6 10	5 07	3 08	2 06	1 08
23	6 07	5 03	3 04	2 02	1 06
24	6 02	4 11	3 01	2 00	1 04
25	5 11	4 08	2 11	1 10	1 02
26	5 07	4 05	2 08	1 06	1 00
27	5 05	4 02	2 06	1 04	0 11
28	5 01	3 10	2 04	1 02	0 10
29	4 10	3 09	2 02	1 00	0 08
30	4 08	3 06	2 00	1 00	0 08
31	4 06	3 03	1 10	1 01	0 07

Now because these Tables shew the value of a reversion but to 31 years (though that may be enough for most occasions) yet if you please to know the worth of a reversion for any longer time, this brief and more general Table may give you some insight therein.

A Table of Reversions.					The decrease of twenty shillings.		
Rate of the Interest.							
Number of Years.							
Pounds.							
2	15	12	9	7	6	10	0
4	30	24	18	15	12	5	0
8	45	36	27	22	18	2	6
16	60	48	36	30	24	1	3
32	75	60	45	37	30	0	7
64	90	72	54	45	36	0	3
128	105	84	63	52	42	0	2
256	120	96	72	60	48	0	0
512	135	108	81	67	54	0	0
1024	150	120	90	75	60	0	2

Note

Note, you cannot expect this Table so exact as a particular Table; and when you cannot finde your just number of years, you must guess at the increase or decrease by proportion.

This Table is so plain, that it needs no declaration; yet lest any should not understand it, take this direction in the use thereof.

First, finde out your rate of Interest desired, at the top of the Table, then look down in that Column, till you finde your number of years desired (or the nearest thereto) and against this number of years, in that same line upon the right hand of the Table you have the decrease of one pound, or the worth of one pound, or 20 s. in reversion after the said number of years.

And though it make little for our present purpose, yet because it may so fitly be expressed in this Table, I have on the left hand side of the Table expressed the value and increase of one pound in the like number of years.

Example.

Thus in the middle column of the Table, which is cast up at the rate of 8 l. per Cent. you shall finde in the last line, that in the space of 90 years, the reversion of one pound is worth but a farthing, and the in-

E s

crease

crease of one pound comes to 1024 l.

Now the use of these Tables are Thus.

WHen you would know the worth of any thing in reversion, first you must consider the nature of the thing, whether it be an House or Land, and whether you are to buy a Lease, or Fee-simple thereof, and so accordingly by the former rules, finde out what it is worth in ready money, as if it were free from all engagements.

Secondly, according to the nature of the thing, so you may look to have more or less allowance for your money, and so having considered what allowance is fit for the purchase, finde that out at the top of the Table, and in that Column, at, or against the number of years for which the thing is engaged, you shall finde the worth of one pound, or 20 s. in reversion for the said time.

Thirdly, look how many pounds the purchase would be worth in ready money, so many times you must take the said reversion of one pound, and either by addition or multiplication bring it into one summe, and so you have the true value of the reversion.

For example.

A parcel of Land of one hundred pounds yearly Rent, being worth 20 years purchase is worth in ready money 2000l.

Now suppose this Land is mortgaged, or Leased out for 21 years, what is the reversion thereof at the end of 21 years, worth in ready money? Here first you see the Land if it were free from engagements were worth 2000 l. ready money.

Secondly, because it is a reversion of Land, and so certain, it is fit the allowance should be but after the rate of 5 l. per Cent. according as the purchase thereof is worth. Now the first Table of Reversions shew, that one pound, at the end of one and twenty years is worth but 7 s. 2 d. ready money at the said rate of 5 l. per Cent.

Thirdly, this 7 s. 2 d. therefore must be added or multiplied 2000 times according to the full value of the purchase which you may easily do by the Table of accounts following, at the latter end of the Book.

As thus,	<i>l. sh. d.</i>
2000 times 7 s. is	700 00 0
2000 times 2 d. is	016 13 4

In all 716 13 4
 And this is the worth of the said Reversion.
If it be the Reversion of a lease of a house

or

or Land, you must do likewise, only finde the worth of the reversion of one pound, under the Title of 6 l. 8 l. or 10 l. per Cent, as the nature of the thing requires.

For your better instructions herein, you may make use of these following rates, which are grounded upon the first Tables of purchases, yet come much to one reckoning, and perhaps may be somewhat more plain and easie.

I.

If you are to purchase the Reversion of a piece of Land.

First, consider how many years purchase the Land is worth, if it were presently to be possessed, which is about 20 years purchase, for which account 20 pound.

Then look in the Table under the Rate of 6 in the hundred, (which is the Rate fittest for Leases of Land) how much the years, for which it is engaged, comes to.

Now substract this out of the other, and the remaining summe will give you the value of the purchase, accounting the pounds for years, and the shillings and pence for parts of a year.

Thus for Example, any piece of Land being worth 20 years purchase, being engaged

gaged by Lease, or otherwise, for 21 years the reversion will be worth eight years and a quarters purchase.

For, suppose the rent to be one pound or 20 s. a year.

The full value of it is 201. 00s. 00d.

The Lease of 21 years at six
in the hundred, comes to } 11 15 03
which subtracted, shews 08 04 09

That is, eight years, and almost a quarter of a years purchase, and so you may reckon it up for any other yearly Rent.

The like course you must take in purchasing the Reversion of Houses.

First, account their full value, and then subtract the worth of the years for which they are ingaged, at rates according to their goodness.

Thus reckoning a good new built house to be worth 12 years purchase, the reversion thereof after 21 years will be worth about three years, and a quarter, and half a quarters purchase.

For the Rent being 20s. yearly.

	li.	sh.	d.
The full value	201	00	00
The Lease of 21 years at ten	}	08	12 11
in the hundred, comes to		03	07 01
which subtracted, shews,			III

III.

A Tenant hath some time of years in a Lease, and either he or his Land-lord desires to have his years increased to any certain number.

To find the true worth of such a Bargain, you need only find out by the Tables the true value of the whole number of years desired. Then find out likewise the true value of the lesser number of years, that the Tenant hath already. Lastly, subtract the one from the other, and the remainder shews how many years purchase the thing is worth,

Thus a Lease of Land for 60 years, wherein the Tenant hath already a Lease of 21 years, is worth about 4 years and a half purchase.

For the Rent being 20 s. yearly.

<i>The whole 60 years, at</i>	<i>6 per Cent. is worth</i>	<i>1. sh. d.</i>
<i>The 21 years at the same</i>	<i>rate of 6 per Cent. is</i>	<i>16 03 03</i>
<i>Which subtracted, rests</i>		<i>11 15 03</i>
		<i>04 08 00</i>

In like manner a Lease of an house for 60 years, wherein a Tenant hath 21 years already, is worth one year, and a quarters purchase, and somewhat more.

For

For the Rent being 20 s. yearly.

	l.	sh.	d.
The 60 years after ten in the hundred is worth	09	19	04
And 21 years at the same rate, is worth	08	12	11
which subtracted leaves	01	06	05

That is, about one year, and one quarter of a years purchase: so that let the house be of what yearly rent it will, the lease will be worth one year, and a quarter of a years purchase and about a moneth over.

The like you may do for any other number of years.

But these extraordinary long Leases are not so profitable for the Land-lord, for they yield him but little more ready money then a Lease of 20 or 30 years shorter.

As now suppose a Land-lord would make a Lease of Land up to 40 years, wherein his Tenant hath 20 years to come, what may it be worth? you shall finde as before.

The Rent being 20 s. a year.

	l.	sh.	d.
The 40 years are worth at 6 per Centum.	15	00	8
The twenty years at the same rate are worth	11	15	3
which subtracted, rests	03	5	5
Now the Lease of 60 yields but	4	8	0

So that for little more than one years purchase

purchase he may save 20 years benefit to himself or his heirs out of 60 years. And if the Lease should be longer, as an 100 years, his damage would be worse.

So for a Lease of an house,

The 40 years at 10 per	}	li. sh. d.
Centum are worth		9 15 7
The twenty years at the	}	
same rate are worth		8 10 3
which subtracted, Rest.		1 5 4
The Lease for 60 years, yields but		1 6 5

So that by this there will be 20 years saved out of the 60 for very little money. So great loss comes by selling such long Leases or Reversions.

And these Reversions are somewhat considerable in a shorter time; as thus,

Suppose a mans Lease is out within 3 years, and he desires to have a new Lease of 21 years, to begin when his 3 years are out; what is this Lease worth in ready money?

To finde out the worth of this, consider the time he hath in his old Lease, which is 3 years, and this added to 21 years, makes it 24 years. Then look out the full worth of these 24, and subtract from it the worth of the 3 years, the rest is the value of the said Lease in ready money.

Thus, if it be a Lease of Land; The Rent being 20s. a year.

24 years

24 years at six per Centum } li. sh. d.
 are worth } 12 11 0
 And 3 years are worth 2 13 6
 Which subtracted, Rests 9 17 6

Which is ten years, lacking only half a quarters purchase, whereas a Lease of 21 years presently to begin is worth 11 pound, 15 shillings, 3 pence, that is, 11 years and three quarters purchase.

One question more, and so I shall conclude the use of these Tables.

A man hath his life in a parcel of Land, or in an house, and desires to have this Lease for Life changed into a Lease of 21 years.

The rent being 20 s. a year.

A Lease of 21 years of Land, } li. sh. d.
 at six per Centum is worth } 11 15 3
 His life (if strong and lusty) may }
 be worth as much as a Lease of }
 10 years which at the same rate } 7 7 2
 of 6 per Cent. is worth }
 Which subtracted; Rests 4 8 1

And so much is it worth to have his Lease altered, viz. 4 years, and almost half a years purchase.

Many other Rules and Tables concerning Annuities might be propounded, but these I think of most frequent use and necessary consequence, which thus you see may be all per-

performed by this one sort of Tables;

BUT now since none of these Bargains can be made without respect had to these or such like Tables of Interest, or Usury, wherein there must respect be had, not only to simple Use, but to Use upon Use; I hope I may without offence to any speak a word or two in the defence of Usury.

The Argument I shall use is only this; that if it be not only lawful, but necessary to give and take Use upon Use; then, at least, it may be lawful, though not necessary, to give or take moderate simple Use, according to the allowance of the times.

That it is not only lawful but necessary, to take or give Use upon Use, is plainly manifest in all these kinde of Bargains, which cannot be made any other way. Now the necessity of these Bargains is manifest every day, and the lawfulness of them cannot be questioned, being so plainly allowed by the Laws of God, and men.

Indeed many are the abuses thereof, which, if possible, should be reformed; and to this purpose the Law and our Governours have done their parts, not only formerly, but lately, as setting so low a rate of Interest, as 6 per Cent. And according to this new rate I have calculated these Tables, whereby e-

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very one may see what he ought to give or take, and so neither endanger nor endamage himself either way.

A new and exact Table of Interest, shewing the true Interest due upon any Sum of Money for any time, at the rate of 6 per Centum.

For the more exactness in this Table, in every Column the money is reckoned not only in pounds, shillings, and pence, (which is ordinary) but each penny is divided into an hundred parts; which, though it may seem somewhat strange at first, yet they are easily reckoned into farthings, which are more usual with us. For twenty five, which is a quarter of an hundred, make one farthing; fifty of these parts are an half penny, and seventy five are three farthings.

This considered, there will be, I hope, no difficulty in the Tables.

Tables

Tables of Interest at 6 per Cent.

		1 day				2 dayes.				3 dayes			
		li.	sh.	d.	c.	li.	sh.	d.	c.	li.	sh.	d.	c.
Shill.	5				1				2				
	10				2				4				
	15				3				6				
	1				4				8				
	2				8				16				
	3				12				24				
	4				15				31				
	5				19				39				
	6				23				47				
	7				27				55				
Pounds.	8				31				63				
	9				35				71				
	10				39				78				
	20				79			1	58				
	30			1	18			2	36				
	40			1	58			3	15				
	50			1	97			3	94				
	60			2	36			4	73				
	70			2	76			5	52				
	80			3	15			6	31				
Pounds.	90			3	55			7	10				
	100	0	3	94		0	7	89		0	11	8	
	200	0	7	89		1	3	78		1	11	6	
	300	0	11	83		1	11	67		2	11	5	
	400	1	3	76		2	7	56		3	11	34	
	500	1	7	72		3	3	45		4	11	18	
	600	1	11	67		3	11	34		5	11	1	
	700	2	3	61		4	7	23		6	10	85	
	800	2	7	56		5	3	12		7	10	60	
	900	2	11	50		5	11	01		8	10	52	
Pounds.	1000	3	3	45		6	6	90		9	10	43	

Tables of Interest at 6 per Cent.

		4 days				5 days				6 days.			
		l.	sh.	d.	c.	l.	sh.	d.	c.	l.	sh.	d.	c.
Sbill.	5			4					5				6
	10			8					10				12
	15			12					15				18
	1			15					19				23
	2			31					39				47
	3			47					59				71
	4			63					78				94
	5			75					98				118
	6			94		I			118	I			142
Pounds.	7		I	10		I			38	I			65
	8		I	26		I			58	I			89
	9		I	42		I			77	2			113
	10			I 57		I			97		3		38
	20		3	15		3			94		4		73
	30		4	73		5			91		7		10
	40		6	31		7			89		9		46
	50		7	89		9			86		11		83
	60		9	46		11			83	I	2		20
Pounds.	70		11	4		I			80	I	4		57
	80	I	0	62		I			75	I	6		93
	90	I	2	20		I			75	I	9		30
	100	I	3	75		I			72	I	11		67
	200	2	7	56		3			45	3	11		34
	300	3	11	34		4			18	5	10		1
	400	5	3	12		6			90	7	10		68
	500	6	6	90		8			63	9	10		35
	600	7	10	68		9			35	11	10		2
Pounds.	700	9	2	46		11			8	13	9		69
	800	10	6	24		15			80	15	9		36
	900	11	10	2		14			53	17	9		4
	1000	13	1	80		16			26	19	8		71

Tables of Interest at 6 per Cent.

		7 days			8 days			9 days		
		li.	sh.	d. c.	li.	sh.	d. c.	li.	sh.	d. c.
Pounds	Shill.									
	5			7			8			
	10			13			15			
	15			20			23			
	1			27			31			
	2			57			63			
	3			82			94			
	4		I	10		I	26			
	5		I	38		I	57			
	6		I	65		I	89			
Pounds	7		I	93		2	20			
	8		2	21		2	52			
	9		2	48		2	84			
	10		2	76		3	15			
	20		5	52		6	31			
	30		8	28		9	66			
	40		11	04		I	022			
	50		I	180		I	378			
	60		I	457		I	693			
	70		I	733		I	1009			
Pounds	80		I	1009		2	124			
	90		2	0085		2	440			
	100		2	361		2	856			
	200		4	723		5	312			
	300		6	1084		7	1068			
	400		9	246		10	924			
	500		11	608		13	180			
	600		13	969		15	936			
	700		16	131		18	493			
	800		18	493		I 01	049			
Pounds	90		I 0	854		I 03	805			
	1000		I 3	016		I 06	361			

Tables of Interest at 6 per Cent.

		10 dayes			20 dayes			30 dayes		
		li.	th.	d. c.	li.	th.	d. c.	li.	th.	d. c.
Shill.	5			10			19			29
	10			20			39			59
	15			30			59			89
	1			39			78	1	18	
	2			78	1	57		2	36	
	3	1	18		2	36		3	55	
	4	1	57		3	15		4	73	
	5	1	97		3	94		5	91	
	6	2	36		4	73		7	10	
	7	2	76		5	52		8	28	
Pounds.	8	3	15		6	31		9	46	
	9	3	55		7	10		10	65	
	10		3 94			7 89		11	83	
	20		7 89		1	3 73		1	11 67	
	30	11	83		1	11 67		2	11 50	
	40	1	3 78		2	7 36		3	11 34	
	50	1	7 72		3	3 45		4	11 17	
	60	1	11 67		3	11 34		5	11 1	
	70	2	3 61		4	7 23		6	10 84	
	80	2	7 56		5	3 12		7	10 68	
Pounds.	90	2	11 50		5	11 1		8	10 52	
	100	3	3 45		6	6 90		9	10 35	
	200	6	6 90		13	1 80		19	8 71	
	300	9	10 35		19	8 71		1	9 7 06	
	400	13	1 80		1	6 3 61		1	19 5 42	
	500	16	5 26		1	12 10 52		2	9 3 78	
	600	19	8 71		1	19 5 42		2	19 2 13	
	700	1	3 0 16		2	6 0 32		3	9 0 49	
	800	1	6 3 61		2	12 7 23		3	18 10 84	
	900	1	9 7 06		2	19 2 13		4	8 9 20	
	1000	11	2 10 52		3	5 9 44		4	18 7 56	

Tables of Interest at 6 per Cent.

		1 Moneth.	2 Moneths.	3 Moneths.
		li. sh. d.	li. sh. d.	li. sh. d.
Shill.	5	3	60	90
	10	6	1 20	1 80
	15	9	1 30	2 70
	1	1 20	2 40	3 60
	2	2 40	4 80	7 20
	3	3 60	7 20	10 80
	4	4 80	9 60	1 2 40
	5	6 00	1 0 00	1 6 00
	6	7 20	1 2 40	1 9 60
	7	8 40	1 4 80	2 1 30
Pounds	8	9 60	1 7 20	2 4 80
	9	10 80	1 9 60	2 8 40
	10	1 0 00	2 0 00	3 0 00
	20	2 0 00	4 0 00	6 0 00
	30	3 0 00	6 0 00	9 0 00
	40	4 0 00	8 0 00	12 0 00
	50	5 0 00	10 0 00	15 0 00
	60	6 0 00	12 0 00	18 0 00
	70	7 0 00	14 0 00	1 1 0 00
	80	8 0 00	16 0 00	1 4 0 00
Pounds	90	9 0 00	18 0 00	1 7 0 00
	100	10 0 00	1 0 0 00	1 10 0 00
	200	1 00 0 00	2 00 0 00	3 00 0 00
	300	1 10 0 00	3 00 0 00	4 10 0 00
	400	2 00 0 00	4 00 0 00	6 00 0 00
	500	2 10 0 00	5 00 0 00	7 10 0 00
	600	3 00 0 00	6 00 0 00	9 00 0 00
	700	3 10 0 00	7 00 0 00	10 10 0 00
	800	4 00 0 00	8 00 0 00	12 00 0 00
	900	4 10 0 00	9 00 0 00	13 10 0 00
	1000	5 00 0 00	10 00 0 00	15 00 0 00

Tables of Interest at 6 per Cent.

		4 Months.				5 Months.				6 Months.			
		li.	sh.	d.	c.	li.	sh.	d.	c.	li.	sh.	d.	c.
Shill.	5			1	20			1	50			1	80
	10			2	40			3	00			3	60
	15			3	60			4	50			5	40
	1			4	80			6	00			7	20
	2			9	60	1	0	0		1	2	40	
	3			1	2	40	1	6	00	1	9	60	
	4			1	7	20	2	0	00	2	4	80	
	5			2	0	00	2	6	00	3	0	00	
	6			2	4	80	3	0	00	3	7	20	
	7			2	9	60	3	6	00	4	2	40	
Pounds.	8			3	2	40	4	0	00	4	9	60	
	9			3	7	20	4	6	00	5	1	80	
	10			4	0	00	5	0	00	6	0	00	
	20			8	0	00	10	0	00	12	0	00	
	30			12	0	00	15	0	00	18	0	00	
	40			16	0	00	1	00	00	1	04	00	00
	50	1	00	0	00	1	05	0	00	1	10	0	00
	60	1	4	0	00	1	10	0	00	1	16	0	00
	70	1	8	0	00	1	15	0	00	2	2	0	00
	80	1	12	0	00	2	00	0	00	2	8	0	00
Pounds.	90	1	16	0	00	2	05	0	00	2	14	0	00
	100	2	0	0	00	2	10	0	00	3	0	0	00
	200	4	0	0	00	5	00	0	00	6	0	0	00
	300	6	0	0	00	7	10	0	00	9	0	0	00
	400	8	0	0	00	10	00	0	00	12	0	0	00
	500	10	0	0	00	12	10	0	00	15	0	0	00
	600	12	0	0	00	15	00	0	00	18	0	0	00
	700	14	0	0	00	17	10	0	00	21	0	0	00
	800	16	0	0	00	20	00	0	00	24	0	0	00
	900	18	0	0	00	22	10	0	00	27	0	0	00
Pounds.	1000	20	0	0	00	25	00	0	00	30	0	0	00

Tables of Interest at 6 per Cent.

		7 Months				8 Months.				9 Months.			
		i.	sh.	d.	c.	i.	sh.	d.	c.	i.	sh.	d.	c.
Shill.	5			2	10			2	40			2	70
	10			4	20			4	80			5	40
	15			6	30			7	20			8	10
	1			8	40			9	60			10	80
	2	1	4	20		1	7	20		1	9	60	
	3	2	1	80		2	4	80		2	8	40	
	4	2	9	60		3	2	40		3	7	20	
	5	3	6	00		4	0	00		4	6	00	
	6	4	2	40		4	9	60		5	4	80	
Pounds	7	4	10	80		5	7	20		6	3	60	
	8	5	7	20		6	4	80		7	2	40	
	9	6	3	60		7	2	40		8	1	20	
	10		07	00			08	00			09	00	
	20		14	00			16	00			18	00	
	30	1	01	00		1	04	00		1	07	00	
	40	1	08	00		1	12	00		1	16	00	
	50	1	15	00		2	00	00		2	05	00	
	60	2	02	00		2	03	00		2	14	00	
Pounds	70	2	09	00		2	16	00		3	03	00	
	80	2	16	00		3	04	00		3	12	00	
	90	3	03	00		3	12	00		4	01	00	
	100	3	10	00		4	0	00		4	10	00	
	200	7	00	00		8	0	00		9	00	00	
	300	10	10	00		12	0	00		13	10	00	
	400	14	00	00		16	0	00		18	00	00	
	500	17	10	00		20	0	00		22	10	00	
	600	21	00	00		24	0	00		27	00	00	
Pounds	700	24	10	00		28	0	00		31	10	00	
	800	28	00	00		32	0	00		36	00	00	
	900	31	10	00		36	0	00		40	10	00	
	1000	35	00	00		40	0	00		45	00	00	

Tables of Interest at 6 per Cent.

		10 Mon hs.				11 Mon hs.				12 Months.			
		li.	sh.	d.	c.	li.	sh.	d.	c.	li.	sh.	d.	c.
Shill.	5			3	0			3	30			3	60
	10			6	0			6	60			7	20
	15			9	0			9	90			10	50
	1		1	0	0		1	1	20		1	2	40
	2		2	0	0		2	2	40		2	4	80
	3		3	0	0		3	3	60		3	7	20
	4		4	0	0		4	4	80		4	9	60
	5		5	0	0		5	6	00		6	0	00
	6		6	0	0		6	7	20		7	2	40
Pounds.	7		7	0	0		7	8	40		8	4	80
	8		8	0	0		8	9	60		9	7	20
	9		9	0	0		9	10	80		10	9	60
	10		10	0	0		11	0	0		12	0	0
	20	1	00	0	0	1	02	0	0	1	04	0	0
	30	1	10	0	0	1	13	0	0	1	16	0	0
	40	2	00	0	0	2	04	0	0	2	08	0	0
	50	2	10	0	0	2	15	0	0	3	00	0	0
	60	3	00	0	0	3	06	0	0	3	12	0	0
Pounds.	70	3	10	0	0	3	17	0	0	4	04	0	0
	80	4	00	0	0	4	08	0	0	4	16	0	0
	90	4	10	0	0	4	19	0	0	5	08	0	0
	100	5	00	0	0	5	10	0	0	6	00	0	0
	200	10	00	0	0	11	00	0	0	12	00	0	0
	300	15	00	0	0	16	10	0	0	18	00	0	0
	400	20	00	0	0	22	00	0	0	24	00	0	0
	500	25	00	0	0	27	10	0	0	30	00	0	0
	600	30	00	0	0	33	00	0	0	36	00	0	0
Pounds.	700	35	00	0	0	38	10	0	0	42	00	0	0
	800	40	00	0	0	44	00	0	0	48	00	0	0
	900	45	00	0	0	49	10	0	0	54	00	0	0
	1000	50	00	0	0	55	00	0	0	60	00	0	0

The use of these Tables.

NOW to finde the Interest of any summe of money for any time, by this Table: first look the summe of money on the side of the Table; then finde the time required at the head of the Table; and in the square meeting of these two, you shall finde the Interest thereof. Only note, if you cannot finde your summe of money, or the time all at once, you must take it at two or three times and so add them together.

Thus the Interest of 146 pounds for six months will be found thus,

	li. sh. d. c.
100 pounds for 6 months is	3 0 0 0
40 pounds for 6 months is	1 4 0 0
6 pound for 6 months is	0 3 7 20
	<hr/>

In all

4 7 7 20

Which is 4 pounds, 7 shillings, 7 pence and 20 hundred parts of a penny, that is, almost a farthing, as I noted before.

And thus you may do for any other sum of money, and for the more exactness, I have set down the Interest money, not only in months, but in single dayes to a month. Now a month in these Tables is supposed to be just the 12th part of a year, but yet it is ordinarily reckoned by the usual months of the year, *Jan. Feb. March, &c.*

But

But this way of reckoning by months is not altogether so exact as it might be wished; for some months have but 30 dayes, and others 31, and *February* hath commonly but 28. And therefore it may be worth the while (especially in great sums) to look more curiously into the time, and count it by dayes; for otherwise there may be wrong done either to the lender or borrower unawares.

For instance, suppose a Bond made the 10th of *February* for six months, or half a year, the ordinary time. If you reckon by months, it will be due the 10th. of *August*: but since there are 365 dayes in a year, the half thereof is 182 dayes and an half, but you cannot reckon less then 183 dayes; and if you account these 183 days from the 10th. of *February*, they will reach to the 12th. of *August*. So that by reckoning the time by the months, the borrower will pay the money two dayes too soon. Now if the sum of money be but 1000 pound, the Interest for those two dayes will be 6 shillings 7 pence (very near) and so much wrong the borrower receives, and the Statute (perhaps) is broken hereby.

To remedy this, I have observed, that Scriveners usually make such Bonds, to be paid alwayes two dayes after the day

whereon the Bond is dated.

But herein also they may do as much or more wrong on the other side, though with less danger of breaking the Statute. For, suppose a Bond be made upon the 10th. of *August*, they (according to this rule) make it to be paid the 12 of *February*; whereas accounting 183 dayes (as they ought to do) for the half year, the Bond will be (justly) due upon the 9th. of *February*: and so by this means the Lender loseth three dayes Interest.

Again, if a Bond be made the 10th. of *February* to be paid the 12 of *August*; although in this (by chance) there is no wrong to either party: yet if a new Bond be made this 12 of *August*, to be paid the 14 of *February*, the Lender you see in the whole year loseth four dayes, which is very considerable in great sums of money, or when Bonds are often renewed.

To avoid these inconveniences, I have made these following Tables; by which you shall know both the exact time of any part of a year in dayes; and also the Interest which is due for any time or number of dayes: Only herein I must intreat you to walk a step further into the Art of *Arithmetick*, and instead of *Addition* to use *Multiplication*.

Tables

Tables of Interest at 6 per Centum.

	D.	January.	D.	February	D.	March.
1	1	0001.643	32	0052.606	60	009.8630
2	2	0003.287	33	0054.246	61	0100.275
3	3	0004.931	34	0055.890	62	0101.917
4	4	0006.575	35	0057.534	63	0103.561
5	5	0008.219	36	0059.173	64	0105.205
6	6	0009.863	37	0060.821	65	0106.849
7	7	0011.506	38	0062.465	66	0108.493
8	8	0013.150	39	0064.109	67	0110.136
9	9	0014.794	40	0065.753	68	0111.780
10	10	0016.438	41	0067.398	69	0113.424
11	11	0018.082	42	0069.941	70	0115.068
12	12	0019.726	43	0070.684	71	0116.712
13	13	0021.369	44	0072.328	72	0118.356
14	14	0023.013	45	0073.972	73	0120.000
15	15	0024.657	46	0075.616	74	0121.643
16	16	0026.301	47	0077.260	75	0123.287
17	17	0027.945	48	0078.904	76	0124.931
18	18	0029.589	49	0080.547	77	0126.575
19	19	0031.232	50	0082.191	78	0128.219
20	20	0032.876	51	0083.835	79	0129.863
21	21	0034.520	52	0085.479	80	0131.506
22	22	0036.164	53	0087.123	81	0133.150
23	23	0037.808	54	0088.767	82	0134.794
24	24	0039.452	55	0090.410	83	0136.438
25	25	0041.095	56	0092.054	84	0138.082
26	26	0042.739	57	0093.698	85	0139.726
27	27	0044.383	58	0095.342	86	0141.369
28	28	0046.027	59	0096.986	87	0143.013
29	29	0047.671			88	0144.657
30	30	0049.315			89	0146.301
31	31	0050.958			90	0147.945

Tables of Interest at 6 p. r Centum

	D.	April.	D.	May.	D.	June.
1	9	149,589	121	0198,904	152	249,862
2	91	0151,232	122	0200,547	153	251,506
3	92	0152,876	123	202,191	154	253,150
4	94	0154,520	124	0203,835	155	0254,794
5	95	156,164	12	205,479	156	256,438
6	96	157,808	126	207,123	157	258,082
7	97	159,452	127	208,767	158	259,726
8	98	0161,096	128	0210,410	159	0261,369
9	99	162,739	129	212,054	160	263,013
10	100	164,383	13	213,698	161	264,657
11	101	166,027	131	215,342	162	266,301
12	102	0167,671	132	0216,986	163	0267,945
13	103	169,315	133	218,630	164	269,589
14	104	170,958	134	220,273	165	271,233
15	105	172,602	135	221,917	166	272,876
16	106	0174,246	136	0223,561	167	0274,520
17	107	175,890	137	225,205	168	276,164
18	108	177,534	138	226,849	169	277,808
19	109	179,178	139	228,493	170	279,452
20	110	0180,821	140	0230,136	171	0281,095
21	111	182,465	141	231,780	172	282,739
22	112	184,109	142	233,424	173	284,383
23	113	185,753	143	235,068	174	286,027
24	114	0187,397	144	0236,712	175	0287,671
25	115	189,041	145	238,356	176	289,315
26	116	190,684	146	240,000	177	290,959
27	117	192,328	147	241,643	178	292,603
28	118	0193,972	148	0243,287	179	0294,246
29	119	195,616	149	244,931	180	0295,890
30	120	197,260	150	0246,575	181	0297,534
31			151	0248,219		

Tables of Interest at 6 per Centum.

	D.	July.	D.	August.	D.	Septemb.
1	182	0299,170	213	0350,130	241	0401,095
2	183	0300,821	214	0351,785	245	0402,739
3	184	302,465	215	352,424	246	404,353
4	185	304,109	216	353,068	247	406,027
5	186	0305,763	217	0356,712	248	0407,671
6	187	307,397	218	358,356	249	409,315
7	188	3 9,041	219	360,200	250	410,958
8	189	310,684	220	361,643	251	412,602
9	190	312,328	221	363,287	252	414,246
10	191	0313,972	222	0364,931	253	415,890
11	192	315,616	223	366,575	254	417,534
12	193	317,260	224	368,219	255	419,178
13	194	318,904	225	369,863	256	420,821
14	195	320,547	226	371,506	257	422,465
15	196	0322,191	227	0373,150	258	424, 09
16	197	323,835	228	374,794	259	425,753
17	198	325,479	229	376,438	260	427,397
18	199	327,123	230	378,082	261	429,041
19	200	328,767	231	379,726	262	430,684
20	201	0330,410	232	0381,369	263	432,328
21	202	332,054	233	383,013	264	433,972
22	203	333,698	234	384,657	265	435,616
23	204	335,542	235	386,301	266	437,260
24	205	336,986	236	387,945	267	438,904
25	206	0338,630	237	0389,589	268	0440,547
26	207	340,273	238	391,232	269	442,191
27	208	341,917	239	392,876	270	443,835
28	209	343,561	240	394,520	271	445,479
29	210	345,205	241	396,164	272	0447,123
30	211	0346,849	242	0397,808	273	0448,767
31	212	0348,493	243	0399,452		

Tables of Interest at 6 per Centum.

	D.	October.	J.	Novemb.	D.	Decemb.
1	274	0450,410	305	0501,369	335	550,004
2	275	0452,054	306	0503,013	336	0552,328
3	276	453,698	307	504,657	337	553,972
4	277	455,342	308	506,301	338	555,616
5	278	456,986	309	507,945	339	557,260
6	279	458,630	310	509,589	340	558,904
7	280	0460,273	311	0511,230	341	560,547
7	281	461,917	312	512,876	342	562,191
9	282	463,561	313	514,520	343	563,835
10	283	465,205	314	516,164	344	565,479
11	284	466,849	315	517,808	345	567,123
12	285	0468,493	316	0519,452	346	568,767
13	286	470,136	317	521,095	347	570,410
14	287	471,780	318	522,739	348	572,054
15	288	473,424	319	524,383	349	573,698
16	289	475,068	320	526,027	350	575,342
17	290	0476,712	321	0527,671	351	0576,986
18	291	478,356	322	529,315	352	578,630
19	292	480,000	323	530,958	353	580,273
20	293	481,643	324	532,602	354	581,917
21	294	483,287	325	534,246	355	583,561
22	295	0484,932	326	0535,890	356	0585,205
23	296	486,575	327	537,534	357	586,849
24	297	488,219	328	539,178	358	588,493
25	298	489,863	329	540,821	359	590,136
26	299	0491,506	330	0542,465	360	0591,780
27	300	493,150	331	544,109	361	593,424
28	301	494,794	332	545,753	362	595,068
29	302	496,438	333	547,397	363	596,712
30	303	0498,082	334	0549,041	364	0598,356
31	304	0499,726			365	0600,000

The use of these Tables are thus.

THe Tables are so plain, that I suppose they need no demonstration, being made in the form of a plain Almanack; only I shall shew the use thereof in two or three examples.

I. *If a Bond be dated the 10th of February, when is the half year, or 183 dayes out?*

First, in these Tables you shall finde against the 10th. of *February* the number 41, which shews, it is the one and fortieth day from the beginning of the year; and then if you adde 183 dayes being the half year to this 41, it makes 224 dayes. Then look forward till you finde this number, which you shall finde in this Table against the 12th. of *August*; and this is the day when the half year is finished.

II. *How many dayes is it from the 10th. of August, to the last of December?*

In this you must substract the latter time out of the former time. Thus, against the last of *December*, you shall finde 365 dayes, and against the 10th. of *August* 222 dayes, which substracted out of the other, there remains

mains 143, and so many as the dayes required.

I put down this question because many times it will be needful to know the dayes which fall out in several years, and so the number out of which you should substract; will be less than the number which you should substract out of it; in this case you may first finde the dayes to that years end, and then add the lesser number which falls out in the year following thereunto.

III. Thus if you would know how many days it is from the tenth of August to the ninth of February.

First, from the tenth of August to the years end, as before was found to be 143 dayes; and to this if you add the dayes found against the ninth of February, which are 40. it will make 183 dayes, or half a year, and not the 12. of February, as I noted before.

The like you may do for any other number of dayes, or any other time of a year; only take notice, that the year consisting of 365 dayes, the parts thereof exactly are thus:

One month, or a twelfth part of a year, is 30 dayes 10 hours.

Three months, or one quarter, 91 dayes, 6 hours, Six

Six months or an half, 182 dayes, 12 hours.

*Nine months, or three quarters, 273 dayes,
18. hours.*

But to keep without danger of the Statute, and to allow some favour to the borrower, if you reckon the parts of the Interest money by the time, then reckon thus,
*For one month, or the twelfth part of a year,
31 dayes.*

For three months, or one quarter, 92 dayes.

For six months, or an half, 183 dayes.

For nine months, or three quarters, 274 dayes.

IV. To know what is the true use of any summe of money for any number of dayes, after the rate of 6 per Centum.

Having found out the true number of dayes as is before shewed; finde out this number of dayes in the Table, and there you shall finde in a decimal Fraction the true Interest of one pound for the said time: So that the proportion will be thus.

As 1l. or 10000,000

To the number in the Tables,

So any number of pounds inquired,

To the like number required.

Take this number therefore and multiply it by your principal summe, and then cut

cutting off the seven last figures toward your right hand, the remainder will shew you the pounds which it comes to, and the figures cut off, they are a fraction of a pound. But now in the valuation thereof, you need make use but of the four first figures, reckoning the first figure doubled, and it will shew the shillings; if the second figure be more then five, take five out of it, and reckon one shilling more for it; lastly the remainder of that above five, and the next following figure will shew the farthings, very near, if you abate but one in 25. Or you may finde the true value of these first four figures in the decimal Table, page 26.

For example.

What is the Interest of 555 pounds for about half a year, or 182 dayes?

The number against 182 dayes is

This multiplied 555

0299 178

555

1495890

1495890

1495890

2.

Yields

1616040,790

Which, according to the former Rules and Tables, comes to 16 pound 12 shillings, 1 penny, and a little more, viz. scarce two tenth parts of a farthing.

And

And thus you may do for any other number of even pounds: and if you think this too much labour, then if your principal money be not very much, you need take out but the first 4 figures of the Tables to be multiplied (which are therefore separated from the rest by this point[.]) and then you must cut off but 4 figures from the product, and those remaining will exactly agree with the decimal Table.

Thus, the four first figures of the former number being
Multiplied by

$$\begin{array}{r}
 0299 \\
 555 \\
 \hline
 1495 \\
 14 \mid 459 \\
 95 \\
 \hline
 1615585
 \end{array}$$

Yields

Which is 16l. 12s. very near.

But if you will be more exact and know also the Interest of shillings and pence, if there be any shillings and pence belonging to your principal summe; you must first reduce them into one decimal fraction, by the Table, and then take the 4 first figures of this number in the Table, and multiply them together. And observe how many figures you multiply by, and cut off so many figures from the end of the product

duct, the rest of the figures; if they be three put one cipher before them; if they be two, put two ciphers before them, to make them agree to the 4 places in the Decimal Table, and seek that sum in the Decimal Table, which will shew you the true value thereof. Note, that it cannot exceed 0600, which is 1 shilling 2 pence, and 40 hundred parts.

Thus for example, if your principal summe were 555 pound, 11 shillings, the Interest of the 11 shillings must thus be found:

The Interest for 18 days in 30299
11 shill. reduced into decimals is 55

1495

1495

30164145

By cutting off the two last figures, and adding one cipher to the beginning to make the three figures to four places; the sum is 0164, which in the decimal Table shews 4 pence very near.

Or yet more exactly, if you adde this to your former product of the 555^l.

which was
and this last

16,6043,790

30164,45

In all

16,6108,140

So the whole Interest appears to be 16 pound, 12 shillings, 5 pence.

But, methinks I hear some taxing of me for being so scrupulous in accounting the Interest of money by dayes, and not rather reach some way, how a just abatement should be made for those payments which are made before the year is fully out. For the Act allows to take 6 pound in the hundred for the whole year; now if a man takes 3 pound *per Centum* for the half year; the said 3 pound in the other half year will yield, at the same rate, 1 shilling, 9 pence, 2 farthings; and thus, some think, a man takes more than the Act allows, and comes within the danger thereof.

But the Law herein looks upon the year, as the fittest measure of time to proportion the Interest by; and the intent of the law is to restrain the grosser abuses of Extortioners, and not to take notice of such nicities as this; which would have made it either very large and tedious, by appointing exact Tables for it, moneth by moneth, nay, day by day; or else intricate and full of snares for men to fall in. The plain meaning of the Law is this; that, as a year should measure the time, so the said 6 pound should proportion the Interest; the parts of the one answering to the parts of the

the other ; neither allowing any Interest upon the Interest, for the time under or over a year, nor tying any man to let or take up money for the whole year.

The usual custom therefore in this case is a good Comment upon this Law ; by which most Bonds of this nature are made to be paid at six months ends, and yet the full half of the whole years Interest allowed, which would never have been so long and frequently done, if it had been thought any breach of the Statute.

And therefore, though there might be an allowance made by way of rebatement, and the case may seem somewhat like, yet it is not the same ; neither doth the strictest rebatement used among Merchants, take any notice thereof, but is grounded upon another cause, as you may see more in the next particular.

• Of Rebatement.

MERCHANTS, though they seldom let out Money to use, yet they often take up much; and that not only the common way by Bond, which I spake of before, but by way of Rebatement; which is thus.

A Merchant being to sell any commodity, he either sells it for ready money, or to be paid at a certain time, viz 3, 6, or 12 Months after. But the bargain being thus made, it often falls out, that with good convenience to the buyer, or seller, or both, to have this money paid before it be due; and then there is and ought to be an allowance or abatement between them out of the principal, according to the rate of Interest money allowed at that time.

Now this rebatement hath been usually reckoned by the Table of ordinary Interest, abating so much out of the principal debt, as the use of the said principal would come to in the time agreed upon. But in reckoning thus, there will alwayes be some damage to the Creditor who doth abate, which though in little summes, will not be much

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much

much, yet in greater summes of money, such as this rebatement is most used in, it will be very considerable, and is of late observed by the most skilful Merchants.

For Example.

The Interest of an hundred pound for six months comes to 3 pound. But now suppose *A* oweth to *B* an hundred pound, to be paid six months hence; and *A* and *B* are agreed to give and take rebare; here I say *B* ought not to abate full 3*l.* out of his 100*l.* as the Table of Interest will shew, but somewhat less. Indeed, if the debt had been 103 pound, then there should have been 3 pound abated out of the debt; but there being but an hundred pound due in all, and that not till the end of six months, there must be so much a less proportion for the abatement, as there is a difference between 103 and 100. which may be thus found by the use of proportion.

li. li. li. li.

As 103 to 100. so 100 to 97. 0874.

Which is 97 pound, 1 shilling, 9 pence. So that there is only 2 pound, 18 shillings, 3 pence to be abated, and not 3 pound, as by the other reckoning.

Therefore if you would finde out the worth of any debt, due hereafter in ready money;

money; First finde out by the Tables of Interest, what an hundred pound will yield in the time desired: then work by the rule of proportion thus,

As an 100 pound, with the Interest thereof for that time,

Is to an 100 pounds;

So the debt to be paid at that time

To its worth in ready money.

Thus, to finde the worth of an hundred pound, due 12 moneths hence.

As 106 to 100; so 100 to 94. 3396.

which is 94 pound, 6 shillings, 9 pence 2 farthings. So that here is not six pounds to be abated out of the 100 pound, (as some have thought) but 5 pound, 13 shillings, 2 pence, 2 farthings. And thus the Creditour may save 6 shillings, 9 pence, 2 farthings, which by the other way of reckoning he will rebate in his own wrong, And if the summe be greater, or the time of payment longer, his damage will be more.

Again you see that this money to be rebated doth not increase equally, in an equal time; there was 2 pound, 18 shillings, 3 pence to be abated out of the 100 pound, due at 6 months, but there is 5 pound, 13 shillings, 2 pence, 2 farthings to be abated for the 100 pounds due at 12 moneths; which

(94)

which is not the double of the other, for
it should have been, 5 pound, 16 shillings
6 pence. So that these Tables must be
up for every Month at the least, which
the most usual way of reckoning the time
of payments among Merchants, and that
I have drawn them out to 24 Months
which is as long (I think) as any Merchant
desires to trust, or will be content to reba
for.

Rebate

Pounds.

Pounds.

1
2
3
4
5
6
7
8
9
10

Rebate at 6 per Cent.

	1 Month				2 Months.				3 Months.				
	li.	sh.	d.	c.	li.	sh.	d.	c.	li.	sh.	d.	c.	
Shill.													
5			30			0	59				89		
10			60			1	19			1	77		
15			90			1	78			2	66		
1		1	19			2	37			3	54		
2		2	59			4	75			7	09		
3		3	56			7	12			10	64		
4		4	76			9	50			12	18		
5		5	97			11	87			15	73		
6		7	17			12	25			19	26		
7		8	36			14	62			21	85		
8		9	56			17	00			24	37		
9		10	75			10	27			27	92		
10		11	94			11	70			211	47		
20	1	11	88			3	11	52		5	10	93	
30	2	11	82			5	11	29		8	10	40	
40	3	11	76			7	11	05		11	9	87	
50	4	11	70			9	10	81		14	9	34	
60	5	11	64			11	10	58		17	8	80	
70	6	11	59			13	10	34		1	0	8	27
80	7	11	53			15	10	10		1	3	7	74
90	8	11	47			17	09	86		1	6	7	21
100		9	11	40		19	9	62		1	9	6	68
200		19	10	00		1	19	7	24	2	19	1	36
300	1	9	10	80		2	19	4	87	4	8	8	04
400	1	19	9	61		3	19	2	49	5	18	2	72
500	2	9	9	61		4	19	0	12	7	7	9	40
600	2	19	8	01		5	18	9	74	8	17	4	08
700	3	9	7	82		6	18	7	37	10	6	10	76
800	3	19	7	22		7	18	4	99	11	16	5	44
900	4	9	6	63		8	18	2	61	13	6	0	12
1000	4	19	6	03		9	18	0	25	14	15	6	79

Rebate at 6 per Cent.

		4 Months.				5 Months.				6 Months.			
		li.	th.	d.	c.	li.	th.	d.	c.	li.	th.	d.	c.
Shill.	5			1	18			1	46			1	75
	10			2	35			2	93			3	49
	15			3	53			4	39			5	25
	1			4	70			5	85			6	99
	2			9	41			11	71	1		1	96
	3	1		2	12	1		5	56	1		8	97
	4	1		6	82	1	11	41		2		3	96
	5	1	11	53		2	5	27		2	10	95	
	6	2	4	24		2	11	12		3	5	94	
Pounds.	7	2	8	94		3	4	97		4	0	93	
	8	3	1	65		3	10	83		4	7	92	
	9	3	6	25		4	4	68		5	2	91	
	10	3	11	00		4	19	54		5	9	90	
	20	7	10	12		9	9	07		11	7	80	
	30	11	9	10		14	7	61		17	5	70	
	40	15	8	23		19	6	15	1	3	3	61	
	50	19	7	29		1	4	4	63	1	9	1	51
	60	1	3	6	35	1	9	3	22	1	14	11	43
Pounds.	70	1	7	5	41	1	14	11	76	2	0	9	32
	80	1	11	4	47	1	19	00	29	2	6	7	23
	90	1	15	3	53	1	3	10	85	2	12	5	13
	100	1	19	2	59	2	0	9	36	3	10	3	03
	200	3	18	5	18	4	17	6	73	5	16	6	06
	300	5	17	7	76	7	6	4	10	8	14	9	09
	400	7	16	10	53	9	15	1	46	11	13	0	12
	500	9	16	0	94	12	3	10	83	14	11	3	14
	600	11	15	3	35	14	12	8	19	17	9	6	17
Pounds.	700	13	14	6	12	17	1	5	56	20	7	9	20
	800	15	13	8	70	19	10	2	93	23	6	0	23
	900	17	12	11	29	21	19	0	29	26	4	3	26
	1000	19	12	1	88	24	7	9	66	29	2	6	29

Rebates at 6 per Cent.

		7 Months			8 Months.			9 Months		
		li.	th.	d. c.	li.	th.	d. c.	li.	th.	d. c.
Shill.	5			2 03			2 31			2 5
	10			4 06			4 61			5 17
	15			6 00			6 91			7 7
	1			0 11			9 23		10	3
	2		1	4 23		1	6 46		1	8 67
	3		2	0 35		2	3 69		2	7 00
	4		2	8 46		3	0 92		3	5 36
	5		3	4 58		3	10 15		4	3 67
	6		4	0 69		4	7 38		5	2 08
	7		4	8 85		5	4 62		6	0 38
Pounds.	8		5	4 93		6	1 85		6	10 68
	9		6	1 04		6	11 08		7	9 01
	10		6	9 16		7	8 31		8	7 35
	20		13	6 32		15	4 61		17	2 7
	30	1	0	3 48		1	3 092		1	5 1005
	40	1	7	0 64		1	10 923		1	14 5 40
	50	1	13	9 8		1	18 554		2	3 0 75
	60	2	0	6 96		2	6 185		2	11 8 10
	70	2	7	4 12		2	13 10 15		3	0 3 45
	80	2	14	1 28		3	1 6 46		3	8 10 80
Pounds.	90	3	0	10 44		3	9 2 77		3	17 6 15
	100	3	7	7 59		3	16 11 18		4	6 1 49
	200	6	15	3 19		7	13 10 15		8	12 2 98
	300	10	2	10 78		11	10 9 23		12	18 4 40
	400	13	10	6 38		15	7 8 31		17	4 5 97
	500	16	18	1 97		19	4 7 38		21	10 7 46
	600	20	5	9 57		23	1 6 46		25	16 8 95
	700	23	13	5 16		26	18 5 54		30	2 10 45
	800	27	1	0 76		30	15 4 61		34	8 11 94
	900	30	8	8 35		34	12 3 69		38	15 1 44
Pounds.	1000	33	16	3 95		38	9 2 77		43	1 2 02

Rebate at 6 per Cent.

		10 Months.				11 Months				12 Months			
		i.	sh.	d.	c.	i.	sh.	d.	c.	li.	sh.	d.	c.
Shill.	5			2	85			3	13			3	40
	10			5	71			6	25			6	79
	15			8	57			9	18			10	19
	1	0	11	43		1	0	51		1	1	58	
	2	1	10	86		2	1	02		2	3	17	
	3	2	10	29		3	1	53		3	4	75	
	4	3	9	71		4	2	04		4	6	34	
	5	4	9	14		5	2	56		5	7	92	
	6	5	8	57		6	3	07		6	9	51	
Pounds	7	6	8	00		7	3	58		7	11	09	
	8	7	7	43		8	4	09		8	0	68	
	9	8	6	86		9	4	61		9	2	26	
	10	9	6	28		10	5	12		10	3	85	
	20	19	0	57		1	0	10 23		1	2	7 70	
	30	1	8	6 86		1	11	3 35		1	13	11 55	
	40	1	18	1 14		2	1	8 47		2	5	3 40	
	50	2	7	7 43		2	12	1 59		2	16	7 25	
	60	2	17	1 71		3	2	6 71		3	7	11 15	
Pounds	70	3	6	8 00		3	12	11 83		3	19	12 95	
	80	3	16	2 29		4	3	4 95		4	10	16 00	
	90	4	5	8 57		4	13	10 07		5	1	10 65	
	100	4	15	2 86		5	4	3 18		5	13	2 45	
	200	9	10	5 71		10	8	6 37		11	6	4 92	
	300	14	5	8 57		15	12	9 55		16	19	7 47	
	400	19	0	11 43		20	17	0 74		22	12	9 99	
	500	23	16	2 29		26	1	3 92		28	6	0 45	
	600	28	11	5 15		31	5	7 11		33	19	2 94	
Pounds	700	33	6	8 00		36	9	10 29		39	12	5 43	
	800	38	1	10 86		41	14	1 48		45	5	7 93	
	900	42	17	1 72		46	18	4 66		50	18	10 42	
	1000	47	12	4 57		51	2	7 85		56	12	0 90	

Rebates at 6 per Cent.

		13 Months			14 Months			15 Months		
		li.	lh.	d. c.	li.	lh.	d. c.	li.	lh.	d. c.
	Shill.			3 66			3 92			4 15
	10			7 32			7 85			8 37
	15			10 02			11 70			1 05
	1		1	2 04		1	3 70		1	4 74
	2		2	5 19		2	7 40		2	9 46
	3		3	7 94		3	11 10		4	2 25
	4		4	10 59		5	2 80		5	6 97
	5		6	1 24		6	6 50		6	11 72
	6		7	3 69		7	10 20		8	4 47
	7		8	6 53		9	1 90		9	9 21
	8		9	9 18		10	5 61		11	1 96
	9		10	11 83		11	9 21		12	6 7
	10		12	02 48		13	1 1		13	11 44
	20	1	4	4 96		1	6 2 2	1	7	10 82
	30	1	16	7 44		1	19 3 3	2	1	10 32
	40	2	8	9 91		2	12 4 4	2	15	9 70
	50	3	1	0 39		3	05 5 5	3	9	9 21
	60	3	13	2 87		3	18 6 6	4	3	8 65
	70	4	5	5 45		4	11 7 7	5	7	8 9
	80	4	17	7 83		5	4 8 8	5	11	7 53
	90	5	9	10 31		5	17 9 9	6	5	6 98
	100	6	2	0 79		6	10 10 09	6	19	6 41
	200	12	4	1 58		13	1 8 19	13	19	0 83
	300	18	6	2 37		19	12 6 28	20	18	7 25
	400	24	8	3 15		26	3 4 37	27	18	1 67
	500	30	10	3 94		32	14 2 47	34	17	8 9
	600	36	12	4 73		39	5 0 56	41	17	2 51
	700	42	14	5 52		45	15 10 65	48	16	8 93
	800	48	16	6 31		52	6 8 75	55	16	3 35
	900	54	18	7 10		58	17 6 84	62	15	9 77
	1000	61	00	7 89		65	8 4 93	69	15	4 05

Rebate at 6 per Cent.

	Shill.	16 Months.			17 Months.			18 Months.		
		li.	sh.	d.	li.	sh.	d.	li.	sh.	d.
	5		4	44		4	70		4	95
	10		8	29		9	40		9	91
	15		1	33		1	2 10		1	2 86
Pounds	1		1	5 70		1	6 80		1	7 82
	2		2	11 55		3	1 60		3	3 63
	3		4	5 33		4	8 40		4	11 45
	4		5	11 11		6	1 21		6	7 27
	5		7	4 89		7	10 01		8	3 08
	6		8	10 67		9	4 81		9	11 90
	7		10	4 44		10	11 61		11	6 72
	8		11	10 22		12	6 41		13	2 53
	9		13	4 00		14	1 23		14	10 35
Pounds	10		14	9 70		15	8 02		16	6 16
	20	1	9	7 55	1	11	4 04	1	13	0 33
	30	2	4	5 33	2	7	0 06	2	9	6 50
	40	2	19	3 11	3	2	8 07	3	6	0 66
	50	3	14	0 89	3	18	4 09	4	2	6 83
	60	4	8	10 67	4	14	0 11	4	19	0 99
	70	5	3	8 44	5	9	8 13	5	15	6 16
	80	5	18	6 22	6	5	4 15	6	12	0 33
	90	6	13	4 00	7	1	0 17	7	8	7 49
	100	7	8	1 78	7	16	8 18	8	5	1 65
Pounds	200	14	16	3 55	15	13	4 37	16	10	3 30
	300	22	4	5 33	23	10	0 55	24	15	4 95
	400	29	12	7 11	31	6	8 74	33	00	6 61
	500	37	0	8 89	39	3	4 92	41	05	8 26
	600	44	8	10 67	47	0	1 11	49	10	9 91
	700	51	17	0 40	54	16	9 29	57	15	11 56
	800	59	5	2 22	62	13	5 48	66	1	1 21
	900	66	13	4 00	70	10	1 66	74	6	2 87
	1000	74	1	5 78	78	6	9 84	82	11	4 51

Rebate at 6 per Cent.

		19 Months.				20 Months.				21 Months.			
		li.	sh.	d.	c.	li.	sh.	d.	c.	li.	sh.	d.	c.
Sbills.	5			5	20			5	45			05	70
	10			10	41			10	91			11	40
	15			1	3 62			1	4 36			1	05 10
Pounds.	1		01	03	82		01	09	82		01	10	80
	2		03	05	64		03	07	64		03	09	61
	3		05	02	46		05	03	46		05	08	42
	4		06	11	29		07	03	27		07	07	22
	5		08	08	11		09	01	19		09	06	03
	6		10	04	93		10	10	91		11	04	83
	7		12	01	75		12	08	73		13	03	64
	8		13	10	57		14	06	55		15	02	45
	9		15	07	40		16	04	27		17	01	25
	10		17	04	22		18	02	18		19	00	05
Pounds.	20	1	14	08	44	1	16	04	36	1	18	00	11
	30	2	12	00	66	2	14	00	54	2	17	00	16
	40	3	09	04	88	3	12	08	72	3	16	00	22
	50	4	06	09	10	4	10	10	91	4	15	00	27
	60	5	04	01	32	5	09	01	09	5	14	00	33
	70	6	01	05	54	6	07	03	27	6	13	00	38
	80	6	18	09	76	7	05	05	45	7	12	00	44
	90	7	16	01	98	8	02	07	64	8	11	00	49
	100	00	13	06	19	9	01	09	82	9	10	00	54
	200	17	07	00	38	18	03	07	64	19	00	01	08
Pounds.	300	26	00	06	57	27	03	05	46	28	10	01	63
	400	34	14	00	77	36	07	03	27	38	00	02	17
	500	43	07	06	96	45	09	01	09	47	10	02	71
	600	52	01	01	15	54	10	10	91	57	00	03	26
	700	60	14	07	34	63	12	08	73	66	10	03	80
	800	69	08	01	53	72	14	06	55	76	00	04	34
	900	73	01	07	73	81	16	04	37	85	10	04	39
	1000	86	15	01	92	90	18	02	18	95	00	05	43

Rebate at 6 per Cent.

		22 Months.				23 Months.				24 Months.			
		li.	sh.	d.	c.	li.	sh.	d.	c.	li.	sh.	d.	c.
Sbill.	5			5	94			6	19			06	43
	10			11	89	I	0	38		I	00	85	
	15	I	5	84		I	6	57		I	07	28	
Pounds.	I	I	II	78		2	0	75		2	I	71	
	2	3	II	56		4	I	51		4	3	43	
	3	5	II	35		6	2	26		6	5	14	
	4	7	II	13		8	3	01		8	6	86	
	5	9	10	92		10	3	77		10	8	57	
	6	11	10	70		12	4	52		12	10	29	
	7	13	10	49		14	5	27		15	0	0	
	8	15	10	27		16	6	3		17	I	72	
	9	17	10	5		18	6	78		19	3	42	
	10			19	9 84	I	0	7 53		2	I	5 14	
Pounds.	20	I	19	7 67		2	I	3 6		2	2	10 28	
	30	2	19	5 51		3	I	10 60		3	4	3 43	
	40	3	19	3 35		4	2	6 13		4	5	8 57	
	50	4	19	I 19		5	3	I 67		5	7	I 71	
	60	5	18	II 3		6	3	9 20		6	8	6 86	
	70	6	18	8 86		7	4	4 74		7	10	0 0	
	80	7	18	6 70		8	5	0 27		8	11	5 14	
	90	8	18	4 54		9	5	7 80		9	12	I 28	
	100	9	10	2 38		10	6	3 34		10	14	3 43	
	200	19	16	4 76		20	12	6 7		21	8	6 86	
Pounds.	300	29	14	7 14		30	17	10 I		32	2	10 29	
	400	39	12	9 51		41	5	I 35		42	17	I 71	
	500	49	10	II 89		51	11	4 68		53	11	5 14	
	600	59	9	2 27		61	17	8 2		64	5	8 57	
	700	69	8	4 65		72	3	II 36		75	0	0 0	
	800	79	5	7 3		82	10	2 69		85	14	3 43	
	900	89	5	9 41		92	16	6 3		96	8	6 86	
	1000	99	I	II 78		103	2	9 36		107	2	10 28	

The use of these Tables.

I. **W**Hat is the rebate out of 500 pound due 6 months hence, to be paid at present, and so how much ready money will satisfy the said debt of 500 pound?

By the Table you shall finde that 14 pound, 11 shillings, 3 pence, and half a farthing, is to be abated,

	<i>li. sh. d.</i>
So that, the debt being	500.00.00
The rebatement to be subtracted	14. 11. 3
	<hr/>
So there remains	485.08.09

And so much ready money will satisfy the said debt.

II. If you cannot finde the whole debt in one line of the Tables, or if the debt be to be paid at two or three payments, then you must take it out of the Tables severally, and then adde them together.

As suppose *A* hath sold a Bargain to *B* of 1500 pound, to be paid at three six months, 500 pound a time: what is the value of it in ready money?

	li.	sh.	d.	q.
The debt is	1500	00	00	00
Rebate of 500 <i>l.</i> for six months	14	11	03	0
Rebate of 500 <i>l.</i> for 12 months	28	06	00	2
Rebate of 500 <i>l.</i> for 18 months.	41	05	08	1
The Sum of the rebates	84	02	11	3
which subtracted from the whole debt, there remains	1415	17	00	1

The money which must be paid at present.

III. There is another kinde of Rebate-ment by; way of reducing divers times of payment all into one, which is many times used, but yet it is not altogether so exact as it should be,

For Example.

Suppose the said debt of 1500*l.* to be paid at three six months, what time will the whole debt be due to be paid altogether?

The rule is thus: First, multiply the summes of money, by the times of their payment, and adde the severall products together; thus,

(105)

500 pounds | 500 pounds | 500 pounds
By 6 moneths. | by 12 months | by 18 months

is 3000

is 6000

9000

6000

Which three added together,

3000

The summe of them all is 18000

And this product divided by the whole debt 1500 pound, the quotient will shew 12 moneths for the time of payment.

This falls out exactly, if you make your rebate according to the Tables of Interest.

For Example.

The Interest of	l. sh. d.
500l. for 6 moneths is	15 00 0
500l. for 12 moneths is	30 00 0
500l. for 18 moneths is	45 00 0

In all

90 00 0

And so also the Interest
of 1500l. for 12 months is

90 00 0

But here you may see the difference in reckoning these manner of payments, by the Tables of Interest, and by the Tables of rebate.

By the one the rebate is

90 00 0

G 1

By

By the other the rebate is but

84 03 0

So there is saved by this reckoning

05 17 0

Yet this rule of reckoning the time of payment will not be much out of the way, if you reckon the money by the Tables of rebate.

For if the said 1500 pound were to be paid at 12 months, then the worth of it in ready money would appear to be but 1415 pound, 1 shilling, 10 pence, 2 farthings, whereas the true value of the debt in ready money was before found to be 1415 pound, 17 shillings, 1 farthing: by this means therefore the creditor will lose only 15 shillings one penny, 3 farthings more then he ought to rebate.

Yet this way of reducing of payments comes so near the exact truth, that I cannot prescribe a better way in general, to finde it out. But if any will be so punctual, and think it worth their labour, let them try one by the other, & so finding the difference which here is 15 shillings; find out by the Tables of Interest, in how many dayes the 1500 pound will require 15 shillings Interest; and you shall find the nearest time is 3 dayes. For the Interest of 1500 pound for 3 dayes is 14 shillings, 9 pence: these 3 dayes therefore being taken from the 12 months aforesaid, shews the true time due for the pay-

payment of the whole 1500 pound.

IV. If any will be so strict in their Rebate-ments, as to look after any time under a moneth; they may by the former Tables of Interest, finde out the Interest of their principal debt for the odde dayes, and adde that to the rebate-ment for the months, without much error.

But if they will be more exact, let them by the Tables of daily Interest, finde out the Interest of 100 pound for the time desired, and work by the former rule, according to the rule of proportion.

Thus, if you would know the rebate out of an hundred pound for 190 dayes.

The Interest for 190 dayes is 3 pound, 1100 parts. Therefore,

As 103 1200. to 100; so 100 to 96, 9744. which is 96 pound, 19 shillings 6 pence *ferè*.

And thus much for these Tables of Interest. All that I have said hitherto hath been about Interest either simple or compound, by which you may see the good use which may be made thereof, and how the abuse may be avoided and prevented.

And here I thought to have put an end to this little Book. But since there are many other things of a general concernment, and not impertinent to the former Discourse, I shall adde somewhat concerning a few of them, as briefly as I can.

THE
PURCHASERS
P A T E R N :

The Second Part.

Shewing
The Measuring of *Board,*
Land, Timber, Stone, and
the Gauging of *Cask.*

With many other Rules
and Tables of daily use for
most Men.

By *Henry Phillips.*

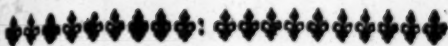
London, Printed by *E. Cotes,* for
Thomas Pierrepont. 1667.



To the Reader.

HE that hath any thing to do with Land or Houses, will have some occasion to have some knowledge in the Art of Measuring Land, Board, Timber, and such like; and therefore I thought good to adjoyn those Geometrical Observations, to the former Discourse: whereby those, whose Genius leads them any thing this way, may attain some good knowledge therein, and receive much profit thereby.

The other things likewise are of such general concernment, and frequent use, that they will be profitable to most: and therefore though they are more commonly written of, yet I hope you will finde somewhat therein worth your reviews and acceptance,



Geometrical Observations.

Of measure, which consists onely in length.

THree Barley Corns make one inch.
 Twelve Inches make one foot.
 Three foot make one yard; which is the common English measure, wherewith most English Commodities are measured. As for the Ell, though it be commonly used among us, yet the Statute takes little or no notice of it, it being a forreign measure, and used about Forreign Commodities, as Silks and French Linnens. The length of the Ell is five quarters of our Yard; so that five Yards are four Ells.

These are the measures, by which all small quantities are measured; but for measuring of Land they make use of Poles or Rods.

16 foot and an half make a Pole or Perch.

40 Poles make a Furlong.

3 Furlongs make a Mile.

So that in a measured Mile, there are,

Poles

Poles 320

Yards 1760

Feet 5280

Inches 63360

Barley-Corns 190080

But the miles commonly accounted from one place to another are more, unless within 20 miles round off London.

To measure things which have length and breadth, as Board, Glass, Pavements, Tiling, Wainscot, and such like.

THese things are all measured after the same way, only there is a difference in the measure by which they are measured. For Board and Glass are measured by the foot; Wainscot, Pavements, &c. by the Yard.

Now in measuring any of these, as Inch, Foot, or Yard, is not only so much in length, but so much in breadth too, that is, so much square; or if it lacks of it one way, it must be made up the other way. So that upon this account there is

9 square feet in one yard.

144 square inches in one foot.

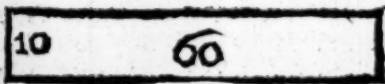
72 square inches in half a foot.

36 square inches in a quarter of a foot.

Now in the measuring of any of these things,

things, you must consider what form or fashion it is of; and accordingly there are several rules.

First, for Boards, they are usually cut out in long squares. And to measure such, you must first take the breadth thereof in Inches, and likewise the length thereof in Inches; and multiply them one by the other; so you shall have the content thereof in inches; then to know how many feet it is, divide this number by 144, the square inches in one foot, and the quotient will shew the number of Feet; and if any thing remain, it is so many square Inches, which you may value by the former Table.



Thus for Example. Suppose a Board to be 10 Inches broad, and 5 foot, or 60 inches long; Multiply 60 by 10, it makes 600, which divided by 144, the quotient will be 4, and there remains 24. So that the board is four feet, and two thirds of one quarter of a foot.

This is the usual form of Boards, only some-

Sometimes they are a little narrower at one end than at the other ; in this case you may take the breadth in the middle of the board, and then do as before,

But because most men have not skill thus to divide and multiply ; therefore they make use of tables and lines set upon rules, to shew any breadth will make a foot ; and so by their Compasses or Ruler, they try how many times the said quantity is contained in the length of that Board, and reckon it to be so many foot long. This way is ancient, and is much used ; and I no wayes find fault therewith : and the Tables hereof are so common, that I shall not need to set them down. Only for variety, and in conformity to some following conclusions I shall present you with this new Table of Board-measure, which may be used as it stands in the Book, or drawn into a line, and set upon a Ruler.

Breadth of the Board in inches.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18

A Table of Board Measure.

F. Parts.			F. Parts.		
1	0,083	<i>The quantity of one foot thereof in length.</i>	19	1,583	<i>The quantity of one foot thereof in length.</i>
2	0,167		20	1,667	
3	0,250		21	1,750	
4	0,333		22	1,833	
5	0,417		23	1,917	
6	0,500		24	2,000	
7	0,583		25	2,083	
8	0,667		26	2,167	
9	0,750		27	2,250	
10	0,833		28	2,333	
11	0,917		29	2,417	
12	1,000		30	2,500	
13	1,083		31	2,583	
14	1,167		32	2,667	
15	1,250		33	2,750	
16	1,333		34	2,833	
17	1,417		35	2,917	
18	1,500		36	3,000	

This

This Table shews the proportion which one foot in the length, having any number of Inches in the breadth hath to one foot of board measure which should contain 144 square Inches, as aforesaid.

It is thus made by this Rule,

As 12 Inches in breadth, and one foot in length,

Is to one foot of board measure;

So any other number of Inches in breadth multiplied by one foot, or 12 Inches in length.

To the proportional part thereof to a foot.

For Example: If you would find the proportion which one foot length of 10 Inches broad, hath to a foot. Multiply this 10 Inches by 12, it makes 120. Then,

As 144 to 1 foot, so 120 to 0, 833.

That is somewhat above three quarters of a foot, being 833 thousand parts of a foot.

But now for the use of this Table.

Having measured the breadth of your board, finde it out in the Table, and take the number you finde there, and multiply it by the feet which are contained in the length of the board; so cutting off the three last figures, you shall have the number of feet, and the figures cut off will shew the parts of a foot.

Thus

Thus in the former example, the Board being 10 inches broad, and 5 feet long.

The number for 10 Inches broad is 0,833
which multiplied by 5

05

Makes,

4,165

That is, four feet, and two thirds of a quarter, as before.

If you think this too much labour you may leave out the last Figure in the Table, and so work by 100 parts of a foot, but the other will be more exact.

And thus much for the usual forms of Boards; as for any other forms of Pavements, Glass, or Wainscot, you may see how they are to be measured in the following examples of Land, which I account the more useful and Gentile employment, and therefore shall speak a little more largely of it.

How to measure any piece of Land.

First, in general, Land is measured by a Pole, Perch, or Rod, which is usually 16 Feet, and an half long; yet in some places they use a Pole of 18 feet especially for Wood-Lands.

Now according to the Statute, 4 Poles in

in breadth, and 40 poles in length make
an Acre. So that

One Acre contains	160	} square Poles.
Half an Acre contains	80	
A quarter, or 1 Rood	40	

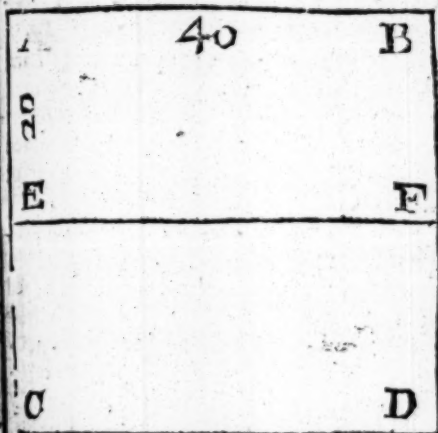
Some use Chains of four or more Poles
long, and divide them, as their fancy pleaseth;
I shall only shew you how to do it
by Poles.

But now since every Field and parcel of
Land hath almost a different form: I shall
shew you first, how to measure some of the
general and common forms; and then
how to reduce others thereunto.

I. How to measure a square piece of Land

THis is one of the most common forms, and the
most easily to be understood. The measuring
hereof, is as I shewed before, in the Board.
For whether it be a long square, or that the
sides be every way equal, as this is, multiply
one of the sides by another of the sides next
unto it, (and the product shews the content
in Poles; which divided by 160 will give the
content in Acres.)

Thus, let the square *ABCD* represent
a piece of Land, being 40 Poles square.
way. This 40 multiplied by 40, make 1600



and this divided by 160, yields 103. which
 The measure of the piece of Land is just 10 Acres.

But now if this Square were longer one
 way then another ; as suppose the upper
 half of it, *ABEF*. Here now *AB* is 40 Poles,
 but *AE* is but 20 ; these two multiplied,
 make 800 ; and this divided by 160, yields 5
 Acres

But here note, that every four-sided piece
 of Land is not square, neither can thus be
 measured ; therefore such four sided irre-
 gular figures may best be reduced into two
 triangles, and so measured, as in the next.

II. To

II, To measure a Triangular; or thr^e sided
piece of Land.

THough there are few parcels of Land
lie in this form, yet this is the most
common form which is measured; because
almost all parcels of Land must be reduced
into these Triangles before they can be
measured.

In the measuring of all sorts of Triangles,
the rule is this.

Observe which is the longest side, and
then measure how many Poles it is from
the Angle opposed to that side by the near-
est way you can, (which is perpendicular-
ly) to that long side; as is represented by
the pricked line in the Triangle following.
Then multiply the half of this line by the
whole long line; or the half of the long
line by the whole of this line, as you shall
see most convenient, and so you shall have
the content of the Triangle in poles, which
you may reduce into Acres, as before.

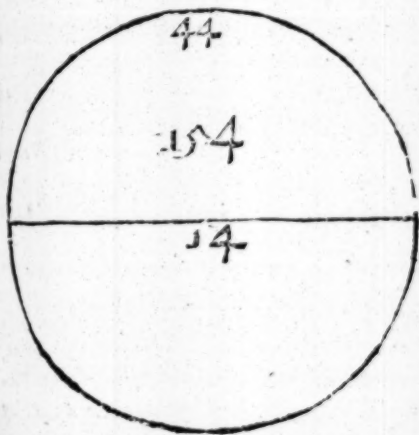


Thus, suppose the longest side of the Triangle to be 60 Poles; and the pricked, or perpendicular line 20 Poles. You may multiply either 60 by 10, or 20 by 30, the product is 600, which divided by 160, shews the content to be three Acres, and three Roods, or Quarters.

III. *To measure a Circular piece of Land.*

THe rule, for the measuring of a Circular piece of Land is this, Multiply half the Compass by half the Diameter.

Note, the Diameter is a line drawn across the midst of the Circle.



H

Thus

Thus the Diameter being 14 Poles, and the compass 44 : the half of both these is 7 and 22, which multiplied together, yield 154 Poles, which lacks only six Poles of an Acre.

Now to this purpose it may be sometimes necessary to know the proportion that there is between the Diameter, and the circumference of a Circle. I confess though the ordinary proportion of 7 to 22 is somewhat too much, yet it is but about 1 in 3000, which will breed no great difference in these operations.

So that if you know the Diameter and would finde the circumference.

As 7 to 22, so the Diameter to the Circumference.

Or if you know the Circumference and would finde the Diameter.

As 22 to 7, so the Circumference to the Diam.

If you will be more exact, reckon,

As 1 to 3, 1416 : so the Diameter to the Circumference.

And as 1, to 0, 3183 : so is the Circumference to the Diameter.

And thus when any piece of Land falls out in this form, you may spare some labour, by measuring only the Diameter, or the Circumference, and finding out the other by these rules aforesaid.

The

The half Circle, and quarter-Circle, or any other part of a Circle more or less, which hath one point or angle at the center of the circle, may be measured by the former rule, *viz.* half the compass, or arching side multiplied by the semidiameter, gives the content thereof.

But other Sections are very hard and troublesome, and scarce to be found out, without knowing the content of the whole Circle or Semicircle; and thereby the greater part thereof; and so the remainder is the lesser Section.

Some to avoid this trouble, measure the perpendicular line, (or the part of the Diameter) by the half of the Arch. But this gives the content very much too little.

For Example.

Suppose in the Quarter Circle, the Radius or Semidiameter being 10000; and

the Arch A D B

15708

Half this compass

7854

Multiplied by the Radius,

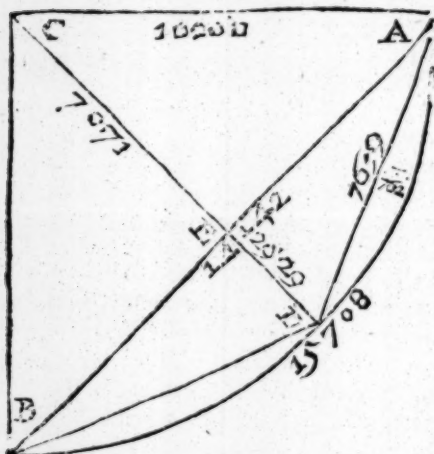
10000

Yields for the content of }
the whole Quadrant. }

7854000

H 2

Again,



Again in Triangle ABC,

The ~~Page~~ AB 12

14142

The half whereof is

707E

Which multiplied by the Perpendicular **EC**

7071

pendiculár E C

Fields for the content thereof

49999041

which should be

50000000

BUT

But the numbers 7071 being not perfect numbers, cause this small difference, which is not to be regarded.

Now the content of the whole quadrant being } 78540000

And the content of the Triangle A B C, a part thereof being subtracted } 50000000

Remains for the Section ADBE 28540000

This being the true content of the said Section, if you try the other Rule by it, you shall finde it much too little.

For the half of the arch ADB is } 7854

Which multiplied by the perpendicular DE } 2929

is only

23004366

Whereas it should be

28540000

But you may save much of the former trouble, and will come more near the truth, if you take the Chord A B, and the perpendicular DE, and multiply the whole of the one by two thirds of the other. Thus, The Chord A B being

14142

Multiplied by two thirds of 2929

1953

Yields

27619326

H 3

which

Which indeed should be

28540

But yet it is much nearer
than the number found
the other way, viz.

23004396

And if the Chord be less, this way will be more exact. And therefore if you will be so curious; you may first find the content of the plain Triangle ADBE in this Section, and then the content of the two little Sections, AD and DB.

Thus the content of the plain
Triangle ADBE will be
found to be

20710959

And the content of the Section AD will thus be found.

The Chord AD is

7659

The Perpendicular

762

The two thirds thereof

508

By which multiplying the Chord,

7659

It yields

3890779

For the content of the Section AD.

Now the Section DE is like to the Section AD in every respect; therefore,

This

This number doubled 3890772
The content of both the sections 7781544
which added to the Trian. ADBE 20710939

Makes the content of the }
whole Section ADBE, } 28492503

whereas it should 28540000

So that it wants only 00047497

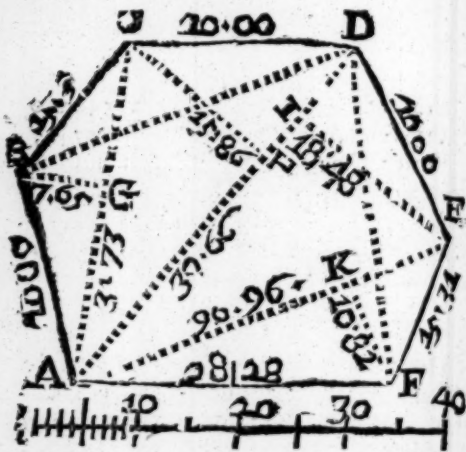
Which though it seems much in these great numbers, yet will scarce be considerable in smaller numbers, and in lesser Sections will come more near to the exact truth

To measure any piece of Land.

Hitherto you have seen how to measure any parcel or ground which lies in any one of these single forms; but very few parcels of ground do so; and therefore before you can measure it, you must reduce it into some of these foresaid figures. Now the most common and best form into which you may reduce any piece of ground, is to lay it out in several Triangles: and this you may do either in the field it self, (if it be not very great) or else you must draw a plot of the field, and so draw several lines overthwart it; which may divide it into as few Triangles (taking in the whole) as possible may be: and then finding the contents of

H 4 these

These several Triangles, and adde them altogether, and so you shall have the content of the whole field.



Thus in this figure which represents a piece of ground, having six unequal sides, you may reduce it into four Triangles, by drawing the three lines, AC , AD , AE , from the Angle at A .

Now to finde the content of this field; first, in the Triangle ABC , you must measure the longest line thereof AC , which is 31 Poles, 73 hundred parts: then measure the perpendicular line BG , which is 7 Poles, 65 parts. Now multiply the one of these numbers by the half of the other, viz.

31. 73.

31. 73. by 3. 82. and so you shall finde
the content of this Triangle to be 121 poles,
21 parts.

Secondly, in the Triangle, *A C D*.

	poles.	parts.
The length of the line <i>A D</i> is	39	66
Length of the perpend <i>C H</i> , is	15	86
So the content thereof is	314	50

Thirdly, in the Triangle, *A D E*.

	poles.	parts.
The length of the line <i>A D</i> is	39	66
Length of the perpend. <i>E I</i> is	18	48
So the content thereof is	366	46

Fourthly, in the Triangle *A E F*.

	poles.	parts.
The length of the line <i>A E</i> is	36	96
Length of the Perpend. <i>F K</i> is	10	82
So the content thereof is	199	95

Now if you adde the content of these
four Triangles altogether, viz.

	poles	parts.
1 The Triangle <i>ABC</i>	121	21
2 The Triangle <i>ACD</i>	314	50
3 The Triangle <i>ADE</i>	366	46
4 The Triangle <i>AEF</i>	199	95
	<hr/>	

The Sum of them is 1002 12

Which is the content of the whole field;
the which if you divide by 160, to bring it
into acres, shews 6 acres, 1 rood, 2 poles, and
12 parts. The

The most difficult task in this work is to finde the true length of the Perpendiculars, especially if you measure it in the field itself, which must alwayes be taken very exactly.

To which purpose, there will be need of two persons to help one another.

Thus, if you would find the length of the perpendicular BG , in the Triangle ABC . Let one party stand at the angle A , and let the other go from A toward C , as directly as he can. Now he that stands at the angle A , will plainly see whether the other swerveth to the right or left never so little, and must direct him; this must be his part in the work. The other man that walks from A towards B , must carefully observe when he comes just against the angle B , that it may be just upon his side, which will be when he is at G , from whence measuring up to B , he shall have the true length of the line GB .

But if you have a plot of the field in paper, then you need only take your Compasses, and setting one foot in B , open the other, so that it may touch the line AC in the nearest place thereof, which is in G , then measure this distance upon your Scale of Poles, and so you shall have the length thereof.

By this you may perceive, that if you can
draw.

draw a true plot of the field in paper, it will be a great help to the measuring thereof. This may be easily done by many Instruments, and those which have skill to use them. Or if a man have but a Ruler with sights, and some convenient device to serve in stead of a stool or table in the field, that so he may lay a sheet of paper thereon, he may draw the foresaid lines to the several angles of the field; and so measuring the length of them, prick them down with his compasses; and drawing the boundary lines, he shall have the true plot of the field.

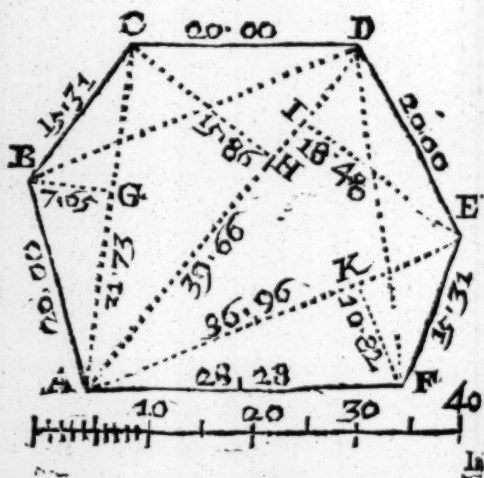
If this also be wanting, yet with a little more labour in measuring, you may thus perform it with your Ruler and Compasses.

First, being at the Angle A, measure the side AB, noting it down in your Book, as also the point of the Compass, which it tends to, which for this purpose you may guess at near enough, if you have any skill therein, or else make use of any Sun-Dial with a Needle and Compass. Then likewise measure the Line BC, noting the length thereof, and the point of the Compass it tends nearest to. Thirdly, measure from C to A, and thus you have the three sides of the Triangle ABC.

Having these three sides, you may with your Ruler and a pair of Compasses, thus

See:

et out this Triangle in any paper. First, drawing the line AC, and setting off the length thereof cut of any Scale of equal parts, make two points at the end thereof at A and C. Then taking the length of the line AB out of the scale, set one foot of your Compasses in A, and with the other make a little arch at B. And then taking the length of the line BC out of the Scale, set one foot of your Compasses in C, and with the other cross the foresaid arch at B; so drawing the lines AB, and BC, you shall have the Triangle A B C truly drawn upon the paper;



In like manner, measuring the side CD, and the breadth of the field from A to D; and setting off the length of these two lines from the points A and C, as before; so you shall have the one half of the field truly drawn.

Then measuring the side DE, and the breadth AE, from the points A and D you may make the angle at E, and so set off another part of the field contained in the triangle ADE.

Lastly, measure the sides of the field EF, and AF, and therewith from the points A and E, make the angle at F.

Thus you have all the angles of the field, so that by drawing the lines from angle to angle, you have the true form thereof, and the lines which you measure cross the field, will be of great use in casting up the content thereof, being the bases of four Triangles; so that you have nothing to measure but the perpendiculars, which you may find out by your Scale, or now see how to measure them more exactly in the field it self.

The fittest Instrument used for this purpose is the plain Table; which, for a shift, you may imitate with any ruler with sights upon it, placing this Instrument at one corner of the field, as at A, you must turn the Ruler to the several angles B, C, D, E, F, and

and draw the lines AB, AC, AD, AE, AF; then measure those distances, and setting off the length thereof by your Scale and Compasses; so you shall have the exact proportion of the field.

Or if you think this measuring too much labour, you may do thus, having taken the proportion of the angles at A, as before, you need measure only any one of the lines (but the most opposite to it is the best) as AD; then set up your Instrument at D, and set off the length off the line AD 39 Poles, 66 parts out of your Scale from A to D, make this D your Center-point, and so turning your Instrument, that the line DA may point directly to the angle at A, move your Ruler about to the other angles C, B, F, E, and draw the lines DC, DB, DF, DE, and where these lines cross the fore-said lines, there lies the true place and posture of these bounds of the field. And if you have a care to draw these lines exactly, you may by your Scale and Compasses measure the length of any of these lines, almost as exactly as in the field it self.

And thus also at two stations, you may draw the plot of any large piece of ground, or the platform of an whole Countrey, with the true distances of all the Towns and Villages therein, which you can see from both these places.

But

But many times it falls out, that in measuring great places, or Woods, or Hilly Grounds, you can see but few of these Angles at once. In this case, you must go round about the Wood or Field, measuring the sides thereof from angle to angle, and by your Instrument very diligently observing the quantity or proportion of these angles: So you shall have the true Symmetry of the field upon your paper, which you may divide into Triangles, and so finde the true quantity thereof, as before.

But these things require a larger Discourse, I have only given you a taste; if you please, you may be better instructed by those who have written at large and expressly hereof, as Mr. Rathborn, Mr. Diggs, and Mr. Leybourn in his *Compleat Surveyor*.

Of the measuring of Solid Bodies.

IN the measuring of Timber, Stone, and such like solid Bodies, there must be respect had not only to the breadth and length, but also to the thickness thereof. And there are many common rules used in the

the measuring of these things, which deserve some corrections.

First, herein you must know, that a foot of timber is a foot square every way, viz. in length, breadth, and thickness: so that it is twelve times more then a foot of Board; a foot of Board being but 144 inches, but a foot of timber is 1728 Inches; and every Inch is square like a Die, and so is the foot also supposed to be; or if it want of this, either in breadth, or in thickness, it must have it in length: so that in what form soever it be, you must reckon thus:

1728 square Inches make one foot.

864 square Inches make half a Foot.

432 square Inches make a quarter of a Foot.

The most common shape which timber is brought into before it be measured is a long Square, having equal sides; for trees growing, for the most part, round, by cutting off from each side alike, they come readily into this square.

Now to finde the content of such a piece of squared Timber, you must multiply the Inches, of the breadth by the Inches of the thickness, and then multiply this product by the Inches of the length; so you shall have the whole solid content in Inches, which if you divide by 1728, the Inches in

one

one foot ; the quotient will shew you how many feet are in the piece of timber.

But this way, though very exact, may seem somewhat too tedious, and therefore men, who have daily use hereof, have tables and lines upon their Rulers ; by which having measured the square of the tree, they know how much in length will make a foot of timber ; and so taking out this with their Compasses, they measure how many times that length is found in the length of the piece of timber ; and so conclude it to be so many feet.

This way, as I shall not speak against it, so it is so common, that I need not set down the tables thereof ; but shall present you with this new Table, which you will finde somewhat more ready and exact, especially if you use your pen.

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A Table shewing the true quantity of one foot length, of any true squared piece of Timber for Inches and half Inches.

Inches Square.	F. pts.		F. pts.		F. pts.	
	—	—	—	—	—	—
	0,002		1,085			4,166
1	0,007	13	1,174	25		4,340
	0,016		1,266			4,513
2	0,028	14	1,361	26		4,694
	0,043		1,460			4,877
3	0,062	15	1,562	27		5,063
	0,085		1,668			5,250
4	0,111	16	1,778	28		5,445
	0,140		1,891			5,670
5	0,174	17	2,007	29		5,840
	0,210		2,127			6,043
6	0,250	18	2,250	30		6,250
	0,293		2,377			6,460
7	0,340	19	2,507	31		6,673
	0,390		2,641			6,890
8	0,444	20	2,778	32		7,111
	0,502		2,918			7,333
9	0,562	21	3,062	33		7,562
	0,627		3,210			7,780
10	0,694	22	3,361	34		8,028
	0,765		3,516			8,263
11	0,840	23	3,673	35		8,507
	0,919		3,835			8,750
12	1,000	24	4,000	36		9,000

The

of one
d piece
ches.

Fpts.

4,166
4,340
4,513
4,694
4,877
5,063
5,250
5,441
5,670
5,840
6,043
6,250
6,460
6,673
6,890
7,111
7,333
7,562
7,800
8,028
8,263
8,507
8,750
9,000

The Demonstration of this Table.

As the common Tables of Timber-measure, shew how many inches and parts, make a foot of timber, the timber being any number of inches square; so this shews you by the square of the timber-log in inches, how many feet, or 1000 parts of a foot are contained in one foot length thereof.

Now because some may desire to enlarge this table, that so it may shew not only for the squares of inches and half inches, but the quarters, or tenth parts of Inches: (though these may be well enough known by the proportion between the Inches and half Inches) yet I shall shew you the ground-work of the table, and so you may enlarge it at pleasure.

A foot of timber, you all know, ought to be 12 inches square every way, viz. 12 inches in breadth, 12 inches in thickness, and 12 inches in length. Therefore this proportion will follow.

ff

The

(140)

If the square of 12 Inches which is 144
Require 1 foot in length, which is parts 1000
What shall any other }
Square, viz. the } which is 36
Square of 6? }
The answer will be 0, 250

The use of the Table of Timber measure.

HAVING the true square of any timber-log in Inches, and the length thereof in feet, to know the content thereof in feet.

Take the number answering to the square of Inches out of the Table, and multiply it by the length in feet.

Thus, a piece of timber 18 Inches square, and 25 foot long.

The number answering to 12 Inches square is

which multiplied by 25 the length

11 | 250
45 | 00

Yields

56 | 250

Viz. 56 feet, and one quarter.

Here may seem some difficulty in finding the product of these mixt numbers, but you may see how to do it in *pag.* 47.

If you think this somewhat too tedious, you may leave out the last figures of the number, and work only by 100 parts of a foot.

Now for the more readineſs, and alſo for the more exactneſs, you may project this table of timber-measure into a line upon your Ruler, in ſuch a manner, that it ſhall ſerve better than the former Table.

But becauſe the foreſaid table falls out in olde parts, which will be very troubleſome to divide; therefore it will be worth the while, to finde how many Inches and parts any certain number of the parts of this line will require, which you may thus finde, and ſo enlarge the following table as you pleaſe.

Take the number 144 for 1000 parts, of 12 Inches, as before. and multiply it by the parts you deſire, and extract the ſquare Root out of the product: note, if it fall out in equal parts, and ſome ciphers to it, that ſo you may have the fraction in a thouſand parts at leaſt.

Thus for

Parts.	Square.	Roots.
0001	000144	0.379
0010	00144	1.200
0100	0144	3.795
1000	144	12.000

Having

Having thus made the Table, or making use of this already made, divide your ruler first into Inches, and then each inch into 10 or 1000 parts, and out of the Table you shall readily set off the parts of the line of measure; which being done handsomely and truly, will shew you the quantity of timber in one foot length of any number of inches square, to the tenth or 100 part of an inch, and to the 1000th. part of a foot, so that having the line, you will have no need of the former Table.

This you may see more plainly how to perform, by the Gauging line, which I have drawn after this sort in its following place.

You may also draw the like line for Board measure, only by dividing each foot of your Ruler into 100, or 1000 parts.

Parts of the Line of Timber-Measure.

1
2
3
4
5
6
7
8
9
100
200
300

A Table for the Division of the Line of Timber-Measure.

	In Pts		In Parts		In Parts	
1	0,397	400	7,589	2500	18,974	
2	0,537	500	8,486	2600	19,349	
3	0,657	600	9,295	2700	19,718	
4	0,759	700	10,040	2800	20,080	
5	0,849	800	10,734	2900	20,435	
6	0,929	900	11,384	3000	20,785	
7	1,004	1000	12,000	3500	22,450	
8	1,073	1100	12,586	4000	24,000	
9	1,138	1200	13,145	4500	25,456	
10	1,200	1300	13,682	5000	26,833	
20	1,697	1400	14,198	5500	28,143	
30	2,078	1500	14,697	6000	29,393	
40	2,400	1600	15,179	6500	30,594	
50	2,683	1700	15,646	7000	31,748	
60	2,939	1800	16,100	7500	32,863	
70	3,175	1900	16,541	8000	33,941	
80	3,394	2000	16,971	8500	34,986	
90	4,000	2100	17,300	9000	36,000	
100	4,795	2200	17,799	9500	36,986	
200	5,367	2300	18,199	10000	37,948	
300	6,573	2400	18,500			

Now

Now the use of this line being set upon your Ruler, will be very ready. For measuring the side of any square piece of Timber, you need never look how many Inches square it is, but the line it self, counting from the right end thereof, will give you the number, which you must multiply by the length of the piece of Timber, measured in feet and hundred parts.

Thus, as before if you finde the side of a piece of Timber to reach to 2. 250. in this line, and the length thereof to be 25 foot, the content thereof is 56 feet and 250 parts, or a quarter of a foot.

To measure Timber, which is not square exactly.

THough this be the common form of Timber, after the first hewing, yet many times by some accident, or by after sawing, there are many pieces of Timber thicker one way than another.

Now in this case it is usual with some men to adde the broader and the narrower sides together, and so to take the half thereof for the true square.

But this must not alwayes be so slighted over, lest you run into great error. For though the error will be little, when the difference between the sides is not much;

much; yet the greater that difference is, the greater will be the error.

For Example.

Let the sides of the timber be 10 inches, & 11 inches; these two added together, make 21, the half whereof is 11; but yet this is not the true square thereof: for 11 times 11 is 121; whereas 10 times 11 is 110, which is the true Area of the said square. Yet here the difference being but one inch in 120, may seem somewhat tolerable.

But now let the sides of the Timber be 12 inches one way, and 6 the other way: these two added together make 18, and the half thereof is 9. Now the square of 9 is 81, but the true square of the Timber is found by multiplying 12 by 6, so the Area is 72. Here you see the error will be intolerable. And it is so much the more unconfessionable, because it gives the buyer so much less than his due.

Mr. Bedwel hath framed a very ingenious Ruler for this purpose, if it be carefully made.

But the best way is to multiply the two sides, and to finde the true Area of the plain; and then by this Table, which you may also project into a line upon your Ruler find out the proportion of a foot, and so multiply it by the length in feet as before.

A Table shewing the solid Content of one foot length, of any piece of Timber, according to the Area, or superficial Content, taken at the end thereof.

<i>The Inches of the Area.</i>	<i>Feet Parts.</i>		<i>Feet Parts.</i>	
	10	007	200	1 389
	20	014	300	2 083
	30	021	400	2 778
	40	028	500	3 472
	50	035	600	4 167
	60	042	700	4 861
	70	049	800	5 556
	80	056	900	6 250
	90	062	1000	6 944
	100	069	2000	13 888
	200	139	3000	20 833
	300	08	4000	27 778
	400	278	5000	34 722
	500	347	6000	41 666
	600	417	7000	48 711
	700	485	8000	55 555
	800	556	9000	62 500
	900	625	10000	69 444
	1000	694	20000	138 888

Like-

Likewise, if your timber-log have any other than a square form, whether it be regular or irregular, you must finde the Area thereof, and so you shall have the quantity of one foot length thereof by this Table.

Thus the Area being 400 Inches.
foot parts

The quantity of one foot }
by the Table is } 2 778

This multiplied by the length 30 feet 30

Shews the content 83,340

To measure round Timber.

THe way commonly used is to gird these round pieces of timber about with a string, and so doubling the string, to take the fourth part thereof for true square.

As for Example.

If the compass of the tree be 48 Inches, they reckon 12 Inches for the true square thereof.

But this is very false, as you may see by this little Circle, casting it up after the common way.

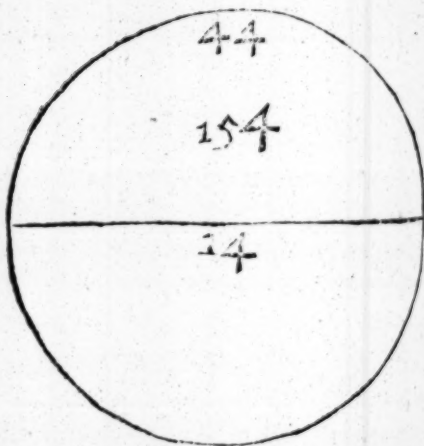
The Diameter of the Circle is 14 inches, the compass 44 inches. This is, according to our rule,

(148)

As 7 to 22.

So the Diameter to the Compass.

Then for the Content of this Circle, if you multiply half of the compass, which is 22, by half of the diameter which is 7; the true content will be 154 inches.



Whereas if you had taken a quarter of the compass, which is 11, for the square root of the circle; this multiplied in it self, would yield but 121 Inches; which wants 33 Inches of the true content: so there would be lost above a fifth part thereof. And thus there

there will be in measuring any other round timber, by this rule, of what compass soever it be, somewhat above a fifth part thereof will be given away.

All that can be said in the defence of this custom is, that though most trees grow round, yet they must be hewed square, before they be fit timber for any use almost; and so this advantage in the measure may very well be allowed, for that which goes to waste in the chips being good for nothing but the fire.

And in my minde, though Carpenters think not of this excuse, but take this rule for an absolute truth; yet this I suppose, was the first occasion of this rule, which may stand with some good reason. For if you consider the former circle, the compass being 44 Inches, the inscribed square will be scarce 10 inches, as appears by this proportion, which you may use for any other.

As 1 to 0,225

So the Compass 44 Inches.

To the inscribed square 9 inches, 900 parts.

This is the greatest square which such a round piece of Timber can be hewn to, and this multiplied in it self, yields 98 Inches; 010 parts for the Area thereof. Now if you adde these two Areas together, viz.

I 3

The

	Inches.
<i>The Area of the inscribed square</i>	98
<i>And the full Area of the Circle</i>	154
<i>The sum thereof will be</i>	252
<i>And the middle or mean of thereof</i>	126
<i>And the content by this Rule was</i>	121

So that this gives an indifferent allowance between the buyer and seller; it being thus measured, neither to the full extent, because of the waste: neither according to the exact square thereof, because that which is cut off, though it be not so good as the other, yet it may be good for somewhat.

But yet for all this, it is fit that the true content of the timber, let it be in what form soever, should be exactly known, and this is that which the measure ought to perform. As for the goodness of the timber, and the waste thereof, men must consider that in the price of the Foot or Tun; and so I believe they do: and therefore being allowed for the waste in the price thereof, there is no reason but they should pay for the full measure which they have, and not have any allowance in that also.

But many desire to buy timber round, and will give as great a price for it as for square timber, because of the allowance which they take to themselves by their false measuring of it.

For,

Inches.
98
154
251
126
121
allow.
it being
extrem,
rding to
r which
d as the
har.
the true
at forme
d this is
perform.
and the
t in the
believe
ved for
re is no
he full
ve any
round,
t as for
owance
their
For,

For first, they compass the tree, and divide the line into three parts, casting away one third part for the waste of the bark and rinde : then the other two parts of the line they divide into four parts, and so take one quarter thereof for the true square. Thus in the foresaid tree, whose compass was 28 Inches, a third thereof, 16 inches allowed for waste, there remains but 32, and then a quarter of this is but 8 Inches, whereas you see before, this tree will make a perfect square of almost ten Inches, and all the other which is cut off will not be quite lost, so that they will have at least the one half of the timber by this way of allowance and false measure.

Therefore by the way you may take notice of the different value which there ought to be, between good clear timber perfectly squared, and that which is not.

The difference between the content of the circle, and the square which may be wrought out of it, as you may see before, is above one third part.

But because all this, specially in great trees, need not go to chips and waste ; you may well in such large round timber, reckon a fifth part for waste, and so the price of five feet thereof to be equal to four feet of square timber ; and in lesser pieces you

may reckon a quarter for the waste, and so four feet thereof to be worth as much as three, and so let it be measured to the full content thereof.

Therefore now I shall, as briefly as I can, shew you the readiest ways to finde the true content of any round piece of timber.

And you may finde this out either by the Diameter, or by the circumference.

If you work by the Diameter, the rule is this;

As 1 to 0, 7854;

So the Square of the Diameter;

To the content of the Circle.

If you work by the compass of the circle, which I think will be best and most ready to be found, then take this rule:

As 1 to 0, 0796.

So the Square of the circumference

To the content of the Circle.

And thus having found the content or Area of the circle, you may by the Table (page 145) finde how many feet are in one foot length thereof.

Or you may work this somewhat shorter, thus,

As 1 to 0,00055262,
 So the square of the circumference
 To the proportion of one foot in length
 thereof, to the measure in feet.

And according to this rule, I have framed this **Table**, to help those that are not so ready in these operations, and so might fall into some mistake. By which taking only the compass of the timber, they may know the quantity of the length of a foot thereof.

I S

A

A Table, which by the Compass of any piece of round timber shews the true measure of one foot length thereof.

Inches of the Compass.

Co	f.pts.	Co	f.pts.	Co	f.pts.
10	0,055	40	0,537	70	2,707
11	0,066	41	0,929	71	2,709
12	0,079	42	0,974	72	2,864
13	0,093	43	1,021	73	2,945
14	0,108	44	1,070	74	3,026
15	0,124	45	1,119	75	3,108
16	0,141	46	1,169	76	3,191
17	0,159	47	1,220	77	3,276
18	0,179	48	1,273	78	3,362
19	0,200	49	1,327	79	3,449
20	0,221	50	1,381	80	3,537
21	0,243	51	1,437	82	3,625
22	0,267	52	1,496	83	3,715
23	0,292	53	1,552	84	3,807
24	0,318	54	1,612	85	3,866
25	0,343	55	1,671	86	3,990
26	0,374	56	1,732	87	4,084
27	0,403	57	1,795	88	4,183
28	0,433	58	1,860	89	4,279
29	0,465	59	1,923	90	4,377
30	0,497	60	1,988	91	4,475
31	0,531	61	2,056	92	4,576
32	0,566	62	2,134	93	4,677
33	0,602	63	2,193	94	4,786
34	0,639	64	2,264	95	4,882
35	0,677	65	2,335	96	4,987
36	0,716	66	2,407	97	5,093
37	0,756	67	2,480	98	5,200
38	0,798	68	2,555	99	5,307
39	0,840	69	2,631	100	5,526

The use of this Table.

THE use of this Table is plain and ready; for having the compass of the timber in inches, finde it out in this Table, and so you shall there finde the true quantity of one foot length thereof, which if you multiply by the number of feet, which the timber hath in length, it shews the true content thereof.

Thus a piece of timber 48 inches in compass, and 20 foot long is 25 feet, 460 parts.

<i>For 48 Inches in compass gives</i>	1,273
<i>which multiplied by 20</i>	20
<i>Yields</i>	<hr/> 25,460

Which is 25 foot, and almost an half; whereas reckoning 12 Inches, which is the quarter of the compass, to be the square, it would yield but 20 feet, and so there would be 5 feet and almost an half lost in this piece of timber.

This Table may be also drawn into a line or two upon a Ruler, but I want time to shew how, therefore I shall leave it to the Artist himself, who shall have most occasion for it.

A Table shewing how many Inches in length makes one foot of Timber, according to the compass of any round piece of Timber.

The Compass of the Tree in Inches.

Co	In pts.	Co	In pts.	Co.	In.pts
10	217.15	40	13.572	70	4.432
11	179.46	41	12.916	71	4.308
12	150.80	42	12.310	72	4.198
13	128.49	43	11.744	73	4.075
14	110.79	44	11.211	74	3.965
15	94.312	45	10.723	75	3.861
16	84.822	46	10.262	76	3.760
17	75.137	47	9.830	77	3.663
18	67.020	48	9.425	78	3.569
19	60.151	49	9.044	79	3.479
20	54.286	50	8.686	80	3.393
21	49.228	51	8.349	81	3.310
22	44.865	52	8.030	82	3.230
23	40.904	53	7.730	83	3.152
24	37.690	54	7.447	84	3.078
25	34.743	55	7.178	85	3.006
26	32.122	56	6.924	86	2.936
27	29.787	57	6.684	87	2.869
28	27.697	58	6.455	88	2.804
29	25.820	59	6.238	89	2.742
30	24.127	60	6.030	90	2.681
31	22.596	61	5.836	91	2.622
32	21.206	62	5.649	92	2.566
33	19.936	63	5.471	93	2.511
34	18.784	64	5.301	94	2.458
35	17.736	65	5.140	95	2.406
36	16.755	66	4.985	96	2.356
37	15.862	67	4.837	97	2.307
38	15.038	68	4.696	98	2.261
39	14.276	69	4.561	99	2.216
				100	2.171

Having received information, that the measuring of round Timber is of much concernment; to make the former Rules more plain, I have added this Table, agreeable to the ordinary wayes and rules of measuring Timber, which shews by the compass of any tree or round timber-log; how many Inches and parts thereof make one foot of Timber, the use whereof is thus.

Take the compass of the tree, and so finde how many inches it is about; look this compass in the Table, and by it you shall see how many inches make a foot of Timber; then with a Ruler, or a pair of Compasses, measure how many times you finde that length in the piece of Timber, and so many feet there is of it. Thus the compass of a tree being 60 Inches, you shall finde in the Table 6 inches, and 030 parts, that is a very little more than 6 Inches in length, make a foot of timber: so that if the tree be 12 foot long, there is very near 24 foot of timber in it: for 12 foot and one inch is somewhat above 24 feet. This being the common way of measuring, I hope needs the less explaining; only because most trees are tapering, you must allow for that as in the next Chapter.

If any tree exceed the compass of 100 inches,

inches, take half the compass, and find the number in the Table belonging thereto, and divide it by 4, or take a fourth part of it, and that makes a foot of Timber. Thus, suppose a tree be 146 inches about; the half of this is 73, and against this in the Table, I finde 4 inches, 075 parts, one quarter whereof, viz, 1 inch, 019 parts makes one foot of timber.

To measure Tapering Timber.

Tapering Timber (according as the base thereof is either round, or right lined) is either a Cone or a Pyramide, or a segment of one of these.

If it be a compleat Cone or Pyramide having but one base, and ending in a sharp point, then you must, multiply the Area of the base by a third part of the height.

Thus, suppose the four-square Pyramide ABC to be 45 foot long, and 18 inches square at the base. You shall finde by the Table of Timber measure (page 136) that 18 inches square yield for the content of one foot length 2 feet, 250 parts: this multiplied by 15 feet, which is one third of the length thereof, makes 33 feet, 750 parts.

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Thus the whole Pyramide is easily measured.

But now suppose there were onely a part thereof to be measured, viz. D K B C, being 30 foot long from D to B, being six inches square at D, and 18 inches square at B, as before.

The common way used herein, is to finde out the square in the very midst thereof, and to work by that as if it were the true square, but this way, though it be true in Flats, as Boards, or Land, yet here it yields alwayes somewhat less.

For according to this rule, the square in the midst at F is 12 inches, and so the piece of timber should be 30 foot in quantity. But this is not the exact truth.

For



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For proof hereof, these two parts of the Pyramide AD and DB must, as you saw before, make up 33 feet, 750 parts.

But the top of the Pyramide AD, measured by the true rule, makes but 1 foot, 250 parts. For the base thereof DK being six Inches square.

The solid content of one foot is	0.250
Which multiplied by a third of	
the length 5 feet	5.000
	<hr/>
Yields	1.250

Now this 1 foot, 250 parts added to the 30 feet, which was thought to be the measure of the lower part DB, makes but 31 feet, 250 parts, whereas you see it should be 33 feet 250 parts. So that here is lost 2 feet, and an half of Timber by this way of measuring.

And this way of *Ramus*, to measure both the parts of the Pyramis, and then to subtract one from the other, seems to me more plain and easie than that prescribed by Mr. *Oughtred*, and Mr. *Wingate*, for the measuring of such tapering-timber. But you may say, How shall we finde the length of that part of the Pyramis which is wanting.

I answer, Observe the difference between the two ends, which in this example is 12 inches, and this proportion will hold well enough in such kinde of Pyramids.

As the difference of the two ends	12 inches.
To the length between them	30 feet.
So the greater base	18 inches.
To the whole length	45 feet
And thus the whole Piramis being found, as before to be	33 feet, 750 parts.
And the top thereof to be subtracted	1 foot, 250 parts.
There remains for the other part	32 feet, 500 parts

And this is the true quantity of the said tapering piece of Timber.

If this way seem too troublesome to the common sort of measurers, they may then measure such pieces of Timber, as if they were two or three several pieces; and thus measuring in the midst of every ten feet length; they will finde the work very easie by these Tables, and much more exact than their common way at once measuring.

Thus, this piece of Timber being 30 foot long,

The Square thereof at G, which is in the midst of the first 10 feet is 16 inches, to which

which there answers in the Table of Timber-measure 1778; which multiplied by 10 by adding a cipher, and setting the (.) a figure forwarder, makes

<i>The like at F, for the next 10 feet, being 12 inches square</i>	}	<i>F. parts</i>
<i>The like at E, for the last 10 feet, being 8 inches square</i>		
		17. 78
		is 10.00
		4. 44

<i>The sum of all three is</i>	32.12
<i>which lacks only</i>	00.28
<i>Of the true content</i>	32.50

As I have shewed you how to do with this square tapering-timber, so you may do by the round tapering-timber, working by the table of round timber (p. 129) Also you may see how to measure any other many-sided Pyramis. But I have been already too long in these things: only the usefulness hereof (all timber being almost of this fashion) and the errors of many herein, and the little which hath been written hereof by others hath made me the more large,

Note, if any of the numbers of these tables be too little for your occasion, you may work by the half thereof,

Thy

Thus, suppose a piece of Timber or Stone to be 48 inches square. This Table, p. 134, reacheth but to 36 inches square; therefore take the half of your number, which will be 24; and this in the Table gives you 2 feet 000 parts; and this is the quantity of one quarter of a foot length thereof, so that if you multiply it by 4, it makes 16 feet which is the content of one foot length of the piece of timber: and so work, as before.

Of GANGING.

There is not much difference (in the thing it self) from measuring of other solids; only they are measured by feet and inches; these by gallons, quarts, and pints, or the parts thereof.

There are two things herein chiefly necessary, yet both much controverted.

First, these Vessels being all of irregular forms, how to reduce them to a regular proportion.

Secondly, to finde the true quantity of the Gallon in cubick inches or parts of a foot.

For

For the first of these, the best way is this according to Mr. Oughtred.

Measure the Diameter of the vessel both at the bung, and at the head thereof; and by the Diameters finde out the Area of the circles. Then take two thirds of the Area of the Circle at the bung, and one third of the Area of the Circle of the head, and add them together: and lastly, multiply the sum thereof by the length of the vessel.

For the second thing, the content of an English Gallon, which is the measure of all these Vessels. This is most commonly received, that a Wine-Gallon contains 231 cubick inches: yet Dr Wybard pleads very strongly, that it is somewhat less, making the Wine-Gallon to be 224 inches, or 224 at most. But the difference being so small, the error will not be much; and therefore till the exact truth be more certainly known, I shall, with the most, follow the first, counting it better to allow rather a little over-measure, than any thing under.

Thus for example, suppose a vessel, whose Diameter at the Bung is 32 inches, and at the head 18 Inches, and the length 40 Inches.

Two thirds of the Circle at the bung are } 536,166

One third of the circle at the head is 84,823

The summe of these 2 620,789

which multiplied by the length } 40

40 Inches The summe is 24839,560

This is the solid content of the vessel.

Now there being 231 cubick Inches in a wine Gallon, if you divide this 24839,560 by 231, you shall finde 107,530

So that there are 107 Gallons, and 530 parts, which is a little above half a Gallon in the said vessel.

According to these rules and observations I have calculated this Table, without which it would be very troublesome to finde this out at length, viz. first the Area of the Circles, and then the content of the Vessel in cubick inches; and lastly, to reduce this into Gallons; therefore this Table shews you one third, and two thirds of the Area of any Circle, ready cast up in the parts of a Gallon, for any Diameter to 60 inches, whereby so much of the labour will be saved.

If you desire a more particular account of the manner of calculating this Table; it is grounded upon these Theorems.

First;

First, as 1 to 0, 7854

So the square of the Diameter, 1 inch

To the content of the Circle. 07854

Secondly, As 231, the square inches in one
Wine Gallon,

To 1 gallon or parts 1,000

So the content of the Circle, 0,7854

To the parts of a gallon, 0,0034

So that the Area of a Circle having one
inch for its Diameter, is the 0, 0034 part of
a gallon.

Now a third part of this number is
0,001133. This number therefore 1133
being multiplied by the square of any Cir-
cles Diameter taken by inch measure, gives
the third part of the content thereof in
Wine measure, which are the parts to be ta-
ken of the Circle at the head of the Cask.
And this same number doubled is two thirds
of the like circle, being the parts to be taken
at the bung of the Cask. Thus much for
the making of the Table; which you may
increase as you please to any parts of an
inch.

A Table for the Gauging of Wine-Vessels.

D	Head	Bung	D.	Head	Bung
	G pts	G pts		G.pts	G.pts
01	0,001	0,002	31	1,089	2,178
02	0,004	0,009	32	1,160	2,321
03	0,010	0,020	33	1,234	2,468
04	0,018	0,036	34	1,310	2,620
05	0,028	0,056	35	1,388	2,776
06	0,041	0,081	36	1,469	2,938
07	0,056	0,111	37	1,551	3,102
08	0,072	0,145	38	1,636	3,272
09	0,092	0,183	39	1,724	3,448
10	0,113	0,226	40	1,813	3,625
11	0,137	0,274	41	1,904	3,809
12	0,163	0,326	42	2,000	4,000
13	0,192	0,383	43	2,096	4,191
14	0,222	0,444	44	2,194	4,388
15	0,255	0,510	45	2,295	4,588
16	0,290	0,580	46	2,398	4,796
17	0,328	0,557	47	2,504	5,007
18	0,367	0,734	48	2,611	5,222
19	0,409	0,888	49	2,721	5,442
20	0,453	0,906	50	2,833	5,665
21	0,500	1,000	51	2,948	5,895
22	0,548	1,097	52	3,065	6,129
23	0,600	1,199	53	3,184	6,367
24	0,653	1,305	54	3,305	6,609
25	0,708	1,416	55	3,428	6,856
26	0,766	1,532	56	3,554	7,108
27	0,826	1,692	57	3,682	7,364
28	0,888	1,777	58	3,813	7,625
29	0,953	1,906	59	3,945	7,890
30	1,020	2,040	60	4,080	8,160

Inches of the Diameter.

The use of this Table is this.

First, measure the Diameter at the Head and finde the number in the Table belonging to it. Then measure the Diameter of the bung, and finde the number belonging to that. Then adde these two together, and multiply the sum thereof by the Inches of the vessels length, measured in the inside of the Vessel from head to head.

Thus, according to Mr. Oughtreds example, in the Circles of proportion: Suppose a Vessel having the Diameter at the Head 18 Inches, the Diameter at the Bung 32 Inches, and the length thereof 40 inches; the content thereof is thus found.

<i>The Table shews</i>	<i>G. parts</i>
For 18 inches at the Head	0, 367
For 32 Inches at the Bung,	2, 321

<i>These two added together, make</i>	2, 688
<i>Which multiplied by the length,</i>	40
<i>being 40 inches</i>	

Makes 107, 530

According to his operation it should be 107 gallons, 530 parts, which difference is of no moment in these conclusions.

Of the Gauging Line.

NOW because this Table is cast up only to whole Inches, though the proportional difference for any part of an Inch may be found easily thereby: yet since the number of these Inches must first be measured by some Rod or other in the Vessel it self; you may set this line so upon your rod, that without having respect to the Inch measure, it will shew you the true Area of the Circle in Gallon measure, by the depth of the Diameter.

This line therefore, though the figure is but four inches long, yet the twelve lines therein are supposed to be one continued line, being in all four feet, or 48 Inches long; which is as long as most vessels require; but you may enlarge it as you please.

Note this line shews only a third part of the Area of any Circle, whose Diameter is measured thereby; so it is properly to be used only in measuring the Diameters at the heads. But if you double the numbers hereof; so you shall have two thirds of the Diameter, and so you may use it for the Diameters at the bung, or else make another line on purpose for them.

These Gauging Rulers are made by Mr. Hayes in Moor-fields by the Popes Head Tavern, and by My. John Nash, at the Globe within Aldgate.

K

4	8	12	16	20	24	28	32	36	40	44	48
1	2	3	4	5	6	7	8	9	10	11	12
100	200	300	400	500	600	700	800	900	1000	1100	1200
1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600
3700	3800	3900	4000	4100	4200	4300	4400	4500	4600	4700	4800
4900	5000	5100	5200	5300	5400	5500	5600	5700	5800	5900	6000
6100	6200	6300	6400	6500	6600	6700	6800	6900	7000	7100	7200
7300	7400	7500	7600	7700	7800	7900	8000	8100	8200	8300	8400
8500	8600	8700	8800	8900	9000	9100	9200	9300	9400	9500	9600
9700	9800	9900	10000	10100	10200	10300	10400	10500	10600	10700	10800
10900	11000	11100	11200	11300	11400	11500	11600	11700	11800	11900	12000

4 8 12 16 20 24 28 32 36 40 44

Now the use of this line is the same with the Table, and is to be only instead of a larger Table, shewing the parts of a Gallon belonging to each inch. As you may see by the former example.

The Gauging line sh ws	G. parts
For 18 inches at the head	0,367
For 32 inches, which must be	1,160 5
doubled, because at the bung.	1,160,5

Yields as before,	2,638,0
And multiplied by the length	40

Yields, as before, 107,520

And thus working by this line, you may readily finde these numbers to the 1000 part of a Gallon, for each 1000 part of an inch, which is as exact I think as need be

And thus this troublesome business is very easily performed, without any Equation of Diameters, or Reduction of Measures; which with some confidence I dare present to the candid censure of the better lea ned, and to the practice of such as have use thereof.

How to make this Gauging-line, and to set it upon a Gauging Rod.

But though this operation by this line is performed easily, yet the making
K 2 of

of this line, will at the first be some trouble, unless you know how to finde out some certain equal numbers thereof, viz. every 5 or 10 parts; otherwise, you will never divide the line either readily or handsomely by the former Table.

Now to finde out these parts, you may remember that 11333, or more exactly, the third part of 34 was the number by which the Table was framed, So that

As 34 to 3, so 1 to 882352941.

This number, or six of the first figures thereof, you must multiply by the parts you desire, and then extract the square-root (as before in the line of Timber measure) so you may finde any part of this line as in this Table, and draw this Gauging-line very exactly thereby, having an inch-line upon your Rule, divided into decimal parts.

Parts.	Squares.	Roots,	Inch parts.
1	882352	939	0.939
10	8823529	2975	2.975
100	88235294	9393	9.393
1000	882352941	29704	29.704

*A Table to divide the Gauging-line for
wine-measure*

<i>line</i>	<i>in parts</i>	<i>line</i>	<i>in parts</i>	<i>line</i>	<i>in parts</i>
1	0,910	160	11,882	400	18,787
2	1,328	170	12,247	410	19,020
3	1,627	180	12,602	420	19,255
4	1,879	190	12,948	430	19,478
5	2,100	200	13,284	440	19,703
6	2,301	210	13,612	450	19,926
7	2,485	220	13,933	460	20,146
8	2,657	230	14,246	470	20,365
9	2,818	240	14,552	480	20,580
10	2,970	250	14,852	490	20,793
20	4,201	260	15,146	500	21,004
30	5,145	270	15,435	510	21,214
40	5,941	280	15,718	520	21,420
50	6,642	290	15,997	530	21,625
60	7,276	300	16,270	540	21,826
70	7,859	310	16,539	550	22,028
80	8,401	320	16,803	560	22,228
90	8,911	330	17,064	570	22,427
100	9,393	340	17,320	580	22,621
110	9,852	350	17,573	590	22,815
120	10,287	360	17,823	600	23,008
130	10,710	370	18,069	610	23,200
140	11,114	380	18,311	620	23,390
150	11,504	390	18,550	630	23,575

*A Table to divide the Gauging line for
Wine-measure.*

<i>line</i>	<i>In. parts</i>	<i>line</i>	<i>In. parts</i>	<i>line</i>	<i>In. parts</i>
640	22,763	880	27,865	2200	44,000
650	23,948	890	28,022	2300	45,000
660	24,132	900	28,180	2400	46,000
670	24,325	910	28,336	2500	46,960
680	24,495	920	28,491	2600	47,890
690	24,674	930	28,646	2700	48,800
700	24,852	940	28,800	2800	49,700
710	25,029	950	28,954	2900	50,580
720	25,205	960	29,105	3000	51,440
730	25,382	970	29,254	3100	52,300
740	25,553	980	29,407	3200	53,137
750	25,725	990	29,555	3300	53,960
760	25,895	1000	29,704	3400	54,777
770	26,066	1100	31,153	3500	55,572
780	26,234	1200	32,530	3600	56,360
790	26,401	1300	33,867	3700	57,137
800	26,569	1400	35,148	3800	57,905
810	26,734	1500	36,380	3900	58,662
820	26,898	1600	37,575	4000	59,409
830	27,062	1700	38,730		
840	27,225	1800	39,853		
850	27,383	1900	40,945		
860	27,548	2000	42,008		
870	27,704	2100	43,045		

Yet because these Gauging lines are not so ready to be had, and many have Gauging lines already which are divided into inches. by which you may exactly measure the Diameters at the head and bung of the vessel; I have encreased the former Table, to shew the third part of the Area of any Circle in Gallon measure, to every tenth part of an inch, which will serve for the Diameters at the head; and then for the Diameters at the bung, you must double the numbers in this Table, and so work as before.

The Table is so plain it needs no explaining, only take notice that you must finde the whole inches in the sides of the Table, and the parts of inches at the head of the Table, and in the square meeting of these two, you shall finde the gallons and parts which you must use before as in the other Table.

line for

In, parts

00 44,000

00 45,000

00 46,000

00 46,960

00 47,890

00 48,800

00 49,700

00 50,580

00 51,440

00 52,300

00 53,137

00 53,960

00 54,777

00 55,572

00 56,360

00 57,137

00 57,905

00 58,662

00 59,409

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A Table of Gauging for Wine Vessels.

Parts of an Inch.

Inches	0	1	2	3	4
	G pts	G pts	G pts	G pts	G pts
1	0,001	0,001	0,002	0,002	0,003
2	0,004	0,005	0,006	0,006	0,007
3	0,010	0,011	0,012	0,012	0,013
4	0,018	0,019	0,020	0,021	0,022
5	0,028	0,029	0,030	0,032	0,033
6	0,041	0,042	0,044	0,045	0,046
7	0,056	0,057	0,059	0,060	0,062
8	0,072	0,074	0,076	0,078	0,080
9	0,092	0,094	0,096	0,098	0,100
10	0,113	0,116	0,118	0,120	0,122
11	0,137	0,140	0,141	0,145	0,147
12	0,163	0,166	0,169	0,171	0,174
13	0,192	0,195	0,197	0,200	0,203
14	0,222	0,225	0,229	0,232	0,235
15	0,255	0,258	0,262	0,265	0,269
16	0,290	0,294	0,297	0,301	0,305
17	0,328	0,331	0,335	0,339	0,343
18	0,367	0,371	0,375	0,379	0,384
19	0,409	0,413	0,418	0,422	0,426
20	0,453	0,458	0,462	0,467	0,472
21	0,500	0,505	0,509	0,514	0,519
22	0,549	0,554	0,559	0,564	0,569
23	0,600	0,605	0,610	0,615	0,620
24	0,653	0,658	0,664	0,669	0,675
25	0,708	0,714	0,720	0,725	0,731
26	0,766	0,772	0,778	0,784	0,790
27	0,826	0,832	0,838	0,845	0,851
28	0,888	0,895	0,901	0,908	0,914
29	0,953	0,960	0,966	0,973	0,980
30	1,020	1,027	1,034	1,041	1,074

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A Table for Gauging of wine Vessels.

Parts of an Inch.

4	5	6	7	8	9
G.pts	G.pts	G.pts	G.pts	G.pts	G.pts
0.00	0.003	0.003	0.003	0.004	0.004
0.007	0.007	0.008	0.008	0.009	0.009
0.015	0.014	0.015	0.016	0.016	0.017
0.02	0.023	0.024	0.025	0.026	0.027
0.033	0.034	0.036	0.037	0.038	0.039
0.046	0.048	0.049	0.051	0.052	0.054
0.062	0.064	0.065	0.067	0.069	0.071
0.080	0.082	0.084	0.086	0.088	0.090
0.100	0.102	0.104	0.107	0.109	0.111
0.122	0.125	0.127	0.130	0.132	0.135
0.147	0.150	0.152	0.155	0.158	0.160
0.174	0.177	0.180	0.183	0.186	0.189
0.203	0.207	0.210	0.213	0.216	0.219
0.233	0.238	0.242	0.245	0.248	0.251
0.269	0.272	0.276	0.279	0.283	0.287
0.305	0.308	0.312	0.316	0.320	0.324
0.343	0.347	0.351	0.355	0.359	0.363
0.384	0.388	0.392	0.396	0.400	0.405
0.426	0.431	0.435	0.440	0.444	0.449
0.472	0.476	0.481	0.486	0.490	0.495
0.519	0.524	0.529	0.534	0.539	0.544
0.569	0.574	0.579	0.584	0.589	0.594
0.620	0.626	0.631	0.636	0.642	0.647
0.675	0.680	0.686	0.691	0.697	0.703
0.731	0.737	0.743	0.749	0.754	0.760
0.790	0.796	0.802	0.808	0.814	0.820
0.851	0.857	0.863	0.870	0.876	0.882
0.914	0.920	0.927	0.934	0.940	0.947
0.980	0.986	0.993	1.000	1.006	1.013
1.074	1.081	1.088	1.095	1.102	1.109

K. 5.

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A Table of Gauging for Wine Vessels.

Parts of Inches.

<i>Inches</i>	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
	<i>G. pts</i>	<i>G. pts</i>	<i>G. pts</i>	<i>G. pts</i>	<i>G. pts</i>
31	1,089	1,096	1,103	1,110	1,117
32	1,160	1,168	1,175	1,182	1,190
33	1,234	1,242	1,249	1,257	1,264
34	1,310	1,318	1,325	1,333	1,341
35	1,388	1,396	1,404	1,412	1,420
36	1,469	1,477	1,485	1,493	1,501
37	1,551	1,560	1,568	1,577	1,585
38	1,636	1,645	1,654	1,662	1,670
39	1,724	1,733	1,741	1,750	1,758
40	1,813	1,822	1,831	1,841	1,850
41	1,905	1,914	1,924	1,933	1,942
42	2,000	2,009	2,018	2,028	2,037
43	2,096	2,105	2,115	2,125	2,135
44	2,194	2,204	2,214	2,224	2,234
45	2,295	2,305	2,316	2,326	2,336
46	2,398	2,408	2,419	2,429	2,440
47	2,504	2,514	2,525	2,536	2,547
48	2,611	2,622	2,633	2,644	2,655
49	2,721	2,732	2,744	2,755	2,766
50	2,833	2,845	2,856	2,868	2,879
51	2,948	2,959	2,971	2,983	2,994
52	3,065	3,076	3,088	3,100	3,112
53	3,284	3,296	3,308	3,320	3,332
54	3,305	3,317	3,330	3,342	3,354
55	3,428	3,441	3,453	3,466	3,479
56	3,554	3,567	3,580	3,593	3,605
57	3,682	3,695	3,708	3,721	3,734
58	3,813	3,826	3,839	3,852	3,866
59	3,945	3,959	3,972	3,986	3,999
60	4,080	4,094	4,107	4,121	4,135

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Vessels.

A Table for Gauging of Wine Vessels.

Parts of Inches.

	4	5	6	7	8	9
	G. pts	G. pts	G. pts	G. pts	G. pts	G. pts
0	1.117	1.125	1.132	1.139	1.146	1.152
2	1.190	1.197	1.204	1.212	1.219	1.227
7	1.264	1.272	1.279	1.287	1.295	1.302
3	1.341	1.349	1.357	1.365	1.373	1.380
2	1.420	1.428	1.436	1.444	1.452	1.461
3	1.501	1.510	1.518	1.526	1.535	1.543
7	1.585	1.594	1.602	1.619	1.619	1.628
2	1.670	1.680	1.689	1.697	1.706	1.715
0	1.755	1.768	1.777	1.786	1.795	1.804
1	1.850	1.859	1.868	1.877	1.886	1.896
3	1.942	1.952	1.961	1.971	1.980	1.990
8	2.037	2.047	2.057	2.066	2.076	2.086
	2.135	2.145	2.154	2.164	2.174	2.184
	2.234	2.244	2.254	2.264	2.275	2.285
	2.336	2.346	2.356	2.367	2.377	2.388
	2.440	2.450	2.461	2.472	2.482	2.493
	2.547	2.557	2.568	2.579	2.589	2.600
	2.655	2.666	2.677	2.688	2.699	2.710
	2.766	2.777	2.788	2.800	2.811	2.822
	2.879	2.890	2.902	2.913	2.925	2.936
	2.994	3.006	3.018	3.030	3.041	3.053
	3.112	3.124	3.136	3.148	3.160	3.172
	3.232	3.244	3.256	3.268	3.281	3.293
	3.354	3.367	3.379	3.391	3.404	3.416
	3.479	3.491	3.504	3.516	3.529	3.542
	3.605	3.618	3.631	3.644	3.657	3.669
	3.734	3.747	3.760	3.773	3.786	3.800
	3.866	3.879	3.892	3.905	3.919	3.932
	3.999	4.013	4.026	4.000	4.153	4.067
	4.135	4.149	4.162	4.176	4.190	4.203

of

Of the measuring of Ale or Beer Vessels.

TO measure Ale or Beer-Vessels, your best way will be to make the like Tables and line as for Wine measure; and so the practice will be all one.

But first you must know the true content of the Ale Gallon, concerning which there are divers reports and accounts. Some ancient Artists, *viz.* Mr. Goodwin, and Mr. Reynolds affirm, that the proportion between the Ale Gallon and Wine-Gallon is as 4 to 5; the Wine-Gallon being 231 inches, and the Ale-Gallon 286 $\frac{3}{4}$. This, by Mr. Oughtred is much lessened, being supposed by him to be but 272 inches, and $\frac{1}{4}$ and Dr. Wybard lessens it somewhat more, making it at the most but 270 inches. But so far as I can learn; there are three sorts of measures in use. The measure for Wine being 231 inches; the measure for dry things, as Corn, &c. being about 272; and the measure for Beer and Ale being 288 inches and $\frac{3}{4}$.

The proportion between these three gallons is 28, 33, 35; but having little to do with the middle Gallon, I shall take the Ale Gallon to be 288 inches and three quarters, and conclude the proportion between the Wine and Ale Gallon to be exactly as 4 to 5.

Now therefore if you have much occasion to gauge Beer-Vessels for your ready use, you may thus make the like Tables and Line as you did for the Wine measure.

As 288 inches three quarters, the inches in one Ale-Gallon,

To the part of a Gallon 1,00000

So the Content of the Circle, having one inch Diameter } 0,7854

To the like parts of a Gallon 0,00272

Now a 3d part of this being 90 & 2 thirds, or 90,666 multiplied by the Square of the Diameter of any Circle taken in inch-measure, gives a third part of the content thereof, which is the measure to be used for the head of the Vessel; and this doubled, shews the number to be used for two thirds of the Diameter at the Bung; and thus you may make a Table for Beer measure to as many inches and parts of inches as you please.

As

As you may see in this following Table of Beer-measure; which you must use as before for Wine-measure.

For Example, the *London* Coopers scantlings for a Beer Barrel is thus.

The Diameter at the head 19 inches, 9 parts
 The Diameter at the Bung, 23 Inches, 0 parts
 The length is 27 inches, 4 parts

Now to finde out the content of this vessel by this Table.

The Table will shew

For the 19 Inches 9 parts at the head	}	G. parts
		00, 359
For the 23 Inches at the bung		00, 480
Which must be doubled or repeated		00, 480

The Sum	01, 319
This multiplied by the length	27, 4
	<hr/> 36, 140

Yields 36 Gallons, and 140 parts over, which is a little above a pint. By which it appears that the Beer Barrel agrees well enough with this rule, and may be a confirmation of the truth of the foresaid proportion between the Wine Gallon and the Beer Gallon, viz. as 4 to five.

The

Table of
fe as be.

rs scant.

9 parts

0 parts

4 parts

his ves.

r. parts

0,359

0,480

0,480

319

4

140

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123

The like you shall finde in the scantling for
the Kilderkin.

G. parts.

Diam. at head 16 Inches 1 part, 00,235

at Bung 18 6 00,314

The same again 00,314

The Sum 00,863

Multiplied by length 21 In. 1 pt. 21.1

Yields 18 Gallons, and 209 parts over, be-
ing about a pint and an half too much.

Thus you see these Rules agree very well
with the Coopers and Brewers, who are
most concerned therein, and would not wil-
lingly allow so much over measure, as the
other rules intimate, but would rather, if
they had any truth, be ready to follow them
for their own advantage.

A

(184)

*A Table for the Gauging**Parts of an Inch.*

<i>Inches</i>	<i>0</i> <i>G.pts</i>	<i>1</i> <i>G.pts</i>	<i>2</i> <i>G.pts</i>	<i>3</i> <i>G.pts</i>	<i>4</i> <i>G.pts</i>
1	0.001	0.001	0,002	0,002	0,002
2	0.004	0.004	0,004	0,005	0,005
3	0.008	0.009	0,009	0,010	0,010
4	0.014	0.015	0,016	0,017	0,017
5	0.023	0.024	0,024	0,025	0,026
6	0.033	0.034	0,035	0,036	0,037
7	0.044	0.046	0,047	0,048	0,050
8	0.058	0.059	0,064	0,062	0,064
9	0.073	0.075	0,077	0,078	0,080
10	0.091	0.092	0,094	0,096	0,098
11	0.110	0.112	0,114	0,116	0,118
12	0.130	0.133	0,135	0,137	0,139
13	0.153	0.156	0,158	0,160	0,163
14	0.173	0.180	0,183	0,185	0,188
15	0.204	0.207	0,209	0,212	0,215
16	0.232	0.235	0,238	0,241	0,244
17	0.262	0.265	0,269	0,271	0,274
18	0.294	0.297	0,300	0,304	0,307
19	0.327	0.330	0,334	0,338	0,341
20	0.363	0.366	0,370	0,374	0,377
21	0.400	0.404	0,407	0,411	0,415
22	0.439	0.443	0,447	0,451	0,455
23	0.480	0.484	0,488	0,492	0,496
24	0.522	0.527	0,531	0,535	0,540
25	0.567	0.571	0,576	0,580	0,585
26	0.613	0.618	0,622	0,627	0,632
27	0.661	0.666	0,671	0,677	0,681
28	0.711	0.716	0,721	0,726	0,731
29	0.762	0.768	0,773	0,778	0,784
30	0.816	0.821	0,827	0,832	0,838

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*of Beer or Ale Vessels.**Parts of an Inch.*

4		5	6	7	8	9
G.pts	Inches	G.pts	G.pts	G.pts	G.pts	G.pts
0,002	1	0,003	0,003	0,003	0,003	0,004
0,005	2	0,006	0,006	0,007	0,007	0,008
0,010	3	0,011	0,012	0,012	0,013	0,014
0,017	4	0,018	0,019	0,020	0,021	0,022
0,026	5	0,027	0,028	0,029	0,030	0,032
0,037	6	0,038	0,039	0,041	0,042	0,043
0,055	7	0,051	0,052	0,054	0,055	0,057
0,064	8	0,065	0,067	0,069	0,070	0,072
0,080	9	0,082	0,084	0,085	0,087	0,089
0,098	10	0,100	0,102	0,104	0,106	0,108
0,118	11	0,120	0,122	0,124	0,126	0,128
0,139	12	0,142	0,144	0,146	0,148	0,151
0,163	13	0,165	0,168	0,170	0,173	0,175
0,188	14	0,191	0,193	0,196	0,199	0,201
0,215	15	0,218	0,221	0,223	0,226	0,229
0,244	16	0,247	0,250	0,253	0,256	0,259
0,274	17	0,278	0,281	0,284	0,287	0,290
0,307	18	0,310	0,314	0,317	0,320	0,324
0,341	19	0,345	0,348	0,352	0,355	0,359
0,377	20	0,381	0,385	0,388	0,392	0,396
0,415	21	0,419	0,423	0,427	0,431	0,435
0,455	22	0,459	0,464	0,467	0,471	0,475
0,496	23	0,500	0,505	0,509	0,514	0,518
0,540	24	0,544	0,549	0,553	0,558	0,562
0,585	25	0,589	0,594	0,599	0,603	0,608
0,632	26	0,637	0,641	0,646	0,651	0,656
0,681	27	0,686	0,691	0,696	0,701	0,706
0,731	28	0,736	0,742	0,747	0,752	0,757
0,784	29	0,789	0,794	0,800	0,805	0,811
0,818	30	0,843	0,849	0,854	0,860	0,866

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A Table for the Gauging

Parts of Inches.

<i>Inches</i>	<i>0</i> <i>G. pts</i>	<i>1</i> <i>G. pts</i>	<i>2</i> <i>G. pts</i>	<i>3</i> <i>G. pts</i>	<i>4</i> <i>G. pts</i>
31	0.871	0.877	0.883	0.888	0.894
32	0.928	0.934	0.940	0.946	0.952
33	0.987	0.993	0.999	1.005	1.011
34	1.048	1.054	1.061	1.067	1.073
35	1.111	1.117	1.123	1.130	1.136
36	1.175	1.181	1.188	1.195	1.201
37	1.241	1.248	1.255	1.261	1.268
38	1.309	1.316	1.323	1.330	1.337
39	1.379	1.386	1.399	1.400	1.407
40	1.449	1.457	1.465	1.472	1.480
41	1.524	1.532	1.539	1.547	1.554
42	1.599	1.607	1.615	1.622	1.630
43	1.676	1.684	1.692	1.700	1.708
44	1.755	1.763	1.771	1.779	1.787
45	1.836	1.844	1.852	1.861	1.869
46	1.919	1.927	1.935	1.944	1.952
47	2.003	2.011	2.020	2.029	2.037
48	2.089	2.098	2.106	2.115	2.124
49	2.177	2.186	2.194	2.203	2.212
40	2.266	2.275	2.285	2.294	2.303
51	2.358	2.367	2.377	2.386	2.395
52	2.451	2.461	2.470	2.480	2.487
53	2.546	2.556	2.566	2.576	2.587
54	2.644	2.654	2.663	2.673	2.683
55	2.742	2.752	2.762	2.772	2.782
56	2.842	2.852	2.863	2.873	2.884
57	2.946	2.956	2.966	2.977	2.987
58	3.050	3.060	3.071	3.081	3.092
59	3.156	3.166	3.177	3.188	3.199
60	3.264	3.274	3.285	3.296	3.307

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*cf Beer or Ale Vessels.**Parts of Inches.*

4	5	6	7	8	9
<i>G.pts</i>	<i>G.pts</i>	<i>G.pts</i>	<i>G.pts</i>	<i>G.pts</i>	<i>G.pts</i>
0,894	0,900	0,905	0,911	0,917	0,923
0,952	0,968	0,964	0,969	0,975	0,981
1,011	1,017	1,024	1,030	1,036	1,042
1,073	1,079	1,084	1,092	1,098	1,104
1,136	1,143	1,149	1,155	1,162	1,168
1,201	1,208	1,215	1,221	1,228	1,234
1,266	1,275	1,282	1,288	1,295	1,302
1,337	1,344	1,351	1,358	1,365	1,372
1,407	1,415	1,422	1,429	1,436	1,443
1,480	1,487	1,494	1,502	1,509	1,517
1,554	1,561	1,569	1,577	1,584	1,592
1,630	1,633	1,645	1,653	1,661	1,669
1,708	1,716	1,724	1,731	1,739	1,747
1,787	1,795	1,803	1,812	1,820	1,828
1,869	1,877	1,885	1,893	1,902	1,910
1,952	1,960	1,969	1,977	1,986	1,994
2,037	2,046	2,054	2,062	2,071	2,080
2,124	2,133	2,142	2,150	2,159	2,168
2,212	2,221	2,230	2,239	2,248	2,257
2,303	2,312	2,322	2,330	2,340	2,349
2,395	2,405	2,414	2,423	2,433	2,442
2,487	2,499	2,509	2,518	2,527	2,537
2,587	2,595	2,605	2,614	2,624	2,634
2,683	2,693	2,703	2,713	2,723	2,732
2,782	2,792	2,802	2,813	2,823	2,833
2,884	2,894	2,904	2,914	2,925	2,935
2,987	2,998	3,008	3,018	3,028	3,039
3,092	3,102	3,113	3,124	3,134	3,145
3,199	3,210	3,221	3,231	3,242	3,253
3,307	3,318	3,329	3,340	3,351	3,362

If you would draw this Table into a line, to set upon a Gauging-Rod, as you did before for the Wine-measure, you must work after the like proportion, altering the number, which must be 272, as was found before.

As 272 to 3, so 1 to ——— 11029411765

This number or the 7 first figures thereof multiplied by the parts of your line, the square root extracted from that product, will give you the length of the Gauge-line in inches and parts.

Parts	Squares	Roots	Inches parts
1	1102941	1050	1,050
10	11029411	3321	3,321
100	110294117	10502	10,502
1000	1102941176	33210	33,210

But this being somewhat troublesome, I have calculated this table to your hands, so that thereby dividing your gauging rod into Inches, and decimal parts, you may easily set these lines upon your Rod, which being truly and handsomely set off, will be more ready and exact for use than the Tables can be, they giving but to the 10th. part of an inch, this visibly shewing to the 100 part of an inch.

A Table to divide a Gauging Rod for Beer Measure.

Rod.	In. parts	Rod	In parts	Rod	In. parts
1	1,050	160	13,284	400	21,004
2	1,485	170	13,693	410	21,265
3	1,819	180	14,090	420	21,523
4	2,102	190	14,476	430	21,778
5	2,348	200	14,852	440	22,029
6	2,572	210	15,219	450	22,278
7	2,779	220	15,577	460	22,524
8	2,972	230	15,927	470	22,768
9	3,151	240	16,270	480	23,009
10	3,321	250	16,605	490	23,247
20	4,696	260	16,934	500	23,483
30	5,752	270	17,257	510	23,717
40	6,642	280	17,573	520	23,948
50	7,416	290	17,885	530	24,178
60	8,135	300	18,190	540	24,405
70	8,787	310	18,491	550	24,630
80	9,393	320	18,787	560	24,852
90	9,963	330	19,078	570	25,072
100	10,501	340	19,365	580	25,291
110	11,015	350	19,647	590	25,509
120	11,504	360	19,926	600	25,724
130	11,974	370	20,201	610	25,938
140	12,426	380	20,473	620	26,150
150	12,562	390	20,740	630	26,360

Parts of the Gauging Rod.

*A Table to divide a Gauging Rod for Beer
or Ale measure.*

Rod	In. parts	Rod.	In. parts	Rod	In. parts
640	26,568	880	31,154	2200	49,259
650	26,775	890	31,330	2300	50,366
660	26,980	900	31,506	2400	51,450
670	27,184	910	31,680	2500	52,510
680	27,386	920	31,854	2600	53,550
690	27,587	930	32,027	2700	54,571
700	27,786	940	32,199	2800	55,572
710	27,984	950	32,370	2900	56,556
720	28,180	960	32,540	3000	57,523
730	28,375	970	32,709	3100	58,473
740	28,569	980	32,877	3200	59,409
750	28,761	990	33,044	3300	60,330
760	28,952	1000	33,210	3400	61,237
770	29,143	1100	34,831	3500	62,131
780	29,331	1200	36,380	3600	63,013
790	29,519	1300	37,866	3700	63,882
800	29,705	1400	39,395	3800	64,739
810	29,890	1500	40,675	3900	65,586
820	30,073	1600	42,009	4000	66,421
830	30,256	1700	43,301	4100	67,246
840	30,438	1800	44,556	4200	68,062
850	30,619	1900	45,778	4300	68,867
860	30,799	2000	46,967	4400	69,663
870	30,977	2100	48,126	4500	70,450

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Additions of Gauging.

Shewing how to Gauge great Tuns.

SINCE my first publishing of these Tables of Gauging, there hath been much use (by reason of the Collection of the excise of Beer and Ale) to measure the large Tuns and Vessels of Brewers, that so it may be known how many Barrels they hold: therefore I shall adde somewhat concerning this as briefly as I can.

Now these Tuns are either made square or round. If these Tuns be square, then the plain and primary way of measuring them, is to take their length and breadth in feet, or inches; and so multiplying the one by the other, to finde the content of the plain or bottom thereof, for one inch in depth: Then multiplying this by the whole depth measured in inches, you have the whole content of the Tun in square inches: Lastly, dividing this by the square inches which are in one Gallon, you may finde how many Gallons it holds, and so easily reduce it into Barrels, or what you will.

If

If these Tuns are round, then you must measure their Compass and Diameter (or finde out one by the other according to art) and multiply the half of the one, by the half of the other; So you shall have the content of the plain or bottom of the Tun in square inches; which multiplied by the Inches of the depth, shews the content of the whole Tun in square inches: which you may reduce and bring into Gallons or Barrels, as before.

But in the reduction of these square inches into Gallons, there hath been a great contest how many square inches are in the Beer or Ale Gallon. The Collectors of the Excise would reckon but 272 inches in the Gallon, according to Mr. *Oughtreds* experiment. The more ancient Artift and the the Coopers allow 288 $\frac{1}{4}$ inches, and I suppose they are in the right, their scantlings agreeing so well therewith, as I shewed before in the Barrel and Kilderkin, and therefore I have still retained that number, and those Tables for the gauging of Barrels, and such like Vessels.

But because it is agreed upon between the Collectors of Excise, and the Brewers, that the Gallon should be reckoned to hold 282 square inches, I have therefore framed this Table for the measuring of these great Tuns

Tuns, according to this proportion:

Now this Table being very brief (having for want of room contracted it into two little pages, which may very well take up ten times as much) if you have much use thereof you may enlarge it as you please; or if you be a little the more careful, to observe these directions in the use thereof, it will do your business as well as a larger Table.

For the understanding hereof you must take notice, that this Table is only made for even feet, and shews the true quantity of the plain, of any square Vessel or Tun, whose length and breadth you know, from one foot square, to twenty foot square; reckoning the said plain to be but one inch deep. This content is set down in the Table in Barrels and parts of a Barrel, reckoning after this manner.

	<i>parts.</i>
<i>Every Barrel contains</i>	10000
<i>Every Kilderkin contains</i>	5000
<i>Every Firkin contains</i>	2500
<i>Every Gallon contains</i>	0278
<i>Every Pottle contains</i>	0139
<i>Every Quart contains</i>	0069½
<i>Every Pint contains</i>	0035

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A

A Table shewing the Content of any square
Tun, in Barrels, and 10000 parts.

Feet of the length or breadth.

	XX	XIX	XVIII	XVII	XVI
	B. pts.	B. pts.	B. pts.	B. pts.	B. pts.
10	5,6733	5,3900	5,1164	4,8228	4,5392
		5,1205	4,8511	4,5817	4,3122
				4,3406	4,0852
			4,5958	4,0994	3,8583
	I				3,6314
1	0,0142	II			
2	0,0284	0,0567	III		
3	0,0426	0,0851	0,1277	IIII	
4	0,0567	0,1135	0,1702	0,2270	V
5	0,0709	0,1418	0,2128	0,2837	0,3546
6	0,0851	0,1702	0,2553	0,3404	0,4255
7	0,0993	0,1986	0,2979	0,3972	0,4905
8	0,1135	0,2270	0,3424	0,4539	0,5674
9	0,1277	0,2553	0,3830	0,5106	0,6303
10	0,1418	0,2837	0,4255	0,5674	0,7092
11	0,1560	0,3120	0,4680	0,6241	0,7801
12	0,1702	0,3404	0,5106	0,6808	0,8510
13	0,1844	0,3688	0,5532	0,7376	0,9220
14	0,1986	0,3972	0,5958	0,7944	0,9929
15	0,2128	0,4254	0,6383	0,8511	1,0639
16	0,2269	0,4535	0,6809	0,9078	1,1348
17	0,2411	0,4823	0,7234	0,9646	1,2057
18	0,2553	0,5106	0,7659	1,0212	1,2766
19	0,2695	0,5390	0,8085	1,0780	1,3475
20	0,2837	0,5674	0,8511	1,1348	1,4184
	I	II	III	IIII	V

Feet of the length or breadth.

A Table shewing the content of any square Tun in Barrels, and 10000 parts.

Feet of the length or breadth.

XV	XIIII	XIII	XII	XI	
B. pts.	B. pts.	B. p.s.	B. pts.	B. pts.	
4,2554	3,9716	3,6080	3,4044	3,1206	20
4,0426	3,7731	3,5036	3,2340	2,9645	19
3,8298	3,5740	3,3192	3,0603	2,8084	18
3,6172	3,3760	3,1348	2,8934	2,6524	17
3,4044	3,1774	2,9504	2,7232	2,4964	16
3,1916	2,9780	2,7660	2,5530	2,3303	15
	2,7802	2,5816	2,3820	2,1842	14
		2,3972	2,2126	2,0282	13
			2,0424	1,8722	12
				1,7162	11
VI	VII	VIII	IX	X	
0,5106	0,6951	0,9080			10
0,5950	0,7944				11
0,6808					12
0,7660	0,8937	1,0214	1,1489		13
0,8511	0,9929	1,1340	1,2766	1,4184	14
0,9361	1,0921	1,2402	1,4042	1,5603	15
1,0212	1,1914	1,3616	1,5318	1,7022	16
1,1064	1,2908	1,4732	1,6596	1,8440	17
1,1915	1,3901	1,5887	1,7573	1,9858	18
1,2766	1,4894	1,7021	1,9149	2,1277	19
1,3618	1,5887	1,8157	2,0426	2,2696	20
1,4468	1,6880	1,9291	2,1703	2,4114	
1,5319	1,7872	2,0425	2,2979	2,5531	
1,6170	1,8865	2,1560	2,4255	2,6950	
1,7022	1,9859	2,2696	2,5532	2,8368	
VI	VII	VIII	IX	X	

Feet of the length or breadth.

The use of this Table will most plainly appear, in the answering these questions.

1. Question. *I would know the content of the bottom of a Tun, which is six foot square each way.*

Ans^r. Look where you finde six foot in the side of the Table, and VI foot in the bottom or upper part of the Table meet in a square, and there you shall finde 0,5106, which shews that a Tun being six foot square, holds 0 Barrels, 5106 parts, that is half a Barrel, and a little more. For 5000 parts is a Kilderkin, or half a Barrel, and 106 parts is about three parts over.

2. Question. *A Tun is nine foot one way, and four foot the other way: What is the content?*

Ans^r. Finde where 9 foot in the side of the Table, and IIII foot in the bottom or upper part of the Table meet, and in the square thereof you shall finde 0,5106, which is the same content as before. For as 6 times 6 foot, is 36 foot; so 4 times 9 foot is also 36 foot.

Now you must understand, that this is the content not of the whole Tun, but only of the plain of the bottom thereof; reckoning the depth of the liquor therein to be just one inch. So that if the Tun, or liquor in the Vessel be 10 inches deep, then

the content thereof will be 10 times as much, viz. 05, 1060, that is 5 Barrels, and 1060 parts. If the Tun or depth of the liquor be 20 inches deep, then it is 20 times as much, that is 10, 2120, or 10 Barrels, 2120 parts, and so you must still multiply the content of the bottom of the Tun, by the number of the inches of the depth of the Tun, or Liquor, and it will give you the content of the whole Tun; all beyond the fourth figure being so many Barrels, and the 4 last figures shew the parts under a Barrel.

And thus when the length and breadth falls out in even feet, it is very easie to know the contents thereof by this little Table.

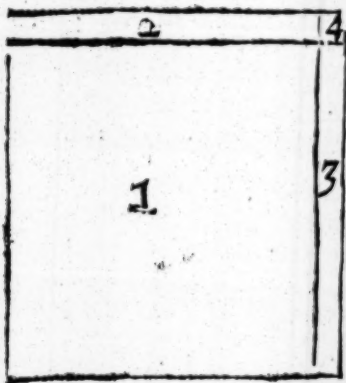
But when the length and breadth of these Tuns falls out to be an odde half, or quarter, or third part of a foot, the Table must either be enlarged, or the labour and care in casting it up will be somewhat the more; which you may do well enough by this Table, by allowing the part proportional between the two, or rather the four nearest numbers, which to those used to these Tables, will be very ready and easie.

But if you will be more exact, then divide your measuring Rod, or Ruler, first into feet, and then let every foot be divided

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ded into ten equal parts, which I suppose will be exact enough for this business of measuring.

Then you must suppose the plain or bottom of the Tun you are to measure, to be divided into 4 unequal squares, or parts, after this manner, expressed by these figures, 1, 2, 3, 4.



The first is the great square made by the even feet.

The second, and third are two long squares on the side of the great square, which are made by the odde parts of the foot, but are equal in length to the great square of even feet.

The

The fourth is the little square in the corner, made only by the odde par of the foot, over and above the length of the even feet.

Thus, if a Tun be 6 foot and an half square, that is, 6 foot, and 5 parts of your rod on each side.

The first or great square, will be six foot square every way, and the content thereof will be found by the Table as before, to be 0 B, 5106 parts.

The second square is the long narrow square on the upper side of the great square, which is six foot long, and half a foot, or 5 ten parts of a foot wide. And the content hereof is found by looking the length thereof, which is six foot in the side of the Table, and the breadth thereof, which is 5 ten parts of a foot in the bottom of the Table, accounting the Numeral Letters, I, II, III, IIII, V, &c. which before stood for feet, now to stand but for ten parts of a foot: and taking the number which you finde in the square meeting thereof, cut off the last figure, and set the rest a place forwarder. Now for 6 foot in the side, and V parts in the bottom, you shall finde 0 4255, which cutting off the last figure, it will be 0,0425, which is the content of this long narrow square, marked 2.

L 3

The

The third square in this example is just equal to the former, being six foot long, and half a foot broad, and so only needs repeating. But if it differ from it, the content thereof must be found out as in the other long square.

Lastly, the 4th. little square in the corner is only half a foot, that is, 5 parts of a foot every way; and the content hereof is found by seeking out these numbers in the side, and the bottom of the Table as before; and cutting off the two last figures from the number found. Thus for 5 in the side, and V in the bottom, you will finde 0,3546, which cutting off the two last figures, will yield 0,0035, for the content thereof.

Now if you adde these 4 parts together, they will shew the true content of the whole square.

	B. parts.
<i>The first square is</i>	0,5106
<i>The second square is</i>	0,0425
<i>The third square is</i>	0,0425
<i>The 4 square is</i>	0,0035
<hr/>	
<i>The sum of all four is,</i>	0,5991

Which is the content of the whole square, and if you multiply this by the inches

ches of the depth, it will shew the content of the whole Tun.

Again, if the Tun be longer one way than the other, there will be some difference in the two long side squares, but the operation is the same.

Suppose a Tun, 5 foot, 5 parts one way, and 6 foot 5 parts the other way. To finde the content.

First, in the great square, 5 foot one way, and VI foot the other way, yields

0,4255

Secondly, 5 foot } yields cutting } 0,0355
by V parts } off the last

Thirdly, 6 foot } figure } 0,0425
by V parts }

Fourthly, 5 parts by V parts, }
yields cutting off the 2 last } 0,0035
figures. }

The Content of all 0,5070

Lastly, if the parts of feet in the breadch of the side squares be not equal, it will be needful to write them down cross wayes.

Thus the Tun being 6 foot 2 parts one way, and 5 foot 8 parts another way.

L 5

First,

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First, 6 foot by V foot, yields,	0,4155
Then 6 f. 2 pts } that } 6 X 8 } yields } 0,0680	
and 5 f. 8 pts } is } 5 X 2 } yields } 0,0141	
Lastly, 8 parts by 2 parts, is	0,0021
	<hr/>
	0,5098
	<hr/>

And thus you may finde out the Content of any square Tun whatsoever, multiplying this Content of the bottom by the inches of the depth.

*Rules for the measuring of round Tuns,
or Vessels.*

First, you must observe whether the Tun be all of one breadth at the top and bottom, or not. If it be of one and the same breadth at the top and the bottom, then it is a Cylinder, and this following Table without any farther trouble readily shews the Content thereof, according to the Inches of the Diameter or breadth thereof, reckoning the liquor therein to be just one inch deep, and this Content is set down in Barrels, and 10000 parts of a Barrel, as before we reckoned in the square Tuns.

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Inches of the Diameter.

A Table, which by the Diameter of any round Tun, shews the content thereof in Barrels, and 10000. parts.

	B.	D.	B.	D.	B.	Di.	B.
	parts.	in.	parts.	in.	parts.	inch	parts.
1	0,0001	31	0,0743	61	0,2879	91	0,6408
2	0,0002	32	0,0794	62	0,2974	92	0,6549
3	0,0007	33	0,0843	63	0,3071	93	0,6692
4	0,0012	34	0,0896	64	0,3169	94	0,6836
5	0,0019	35	0,0950	65	0,3269	95	0,6982
6	0,0028	36	0,1005	66	0,3371	96	0,7130
7	0,0038	37	0,1061	67	0,3474	97	0,7279
8	0,0050	38	0,1118	68	0,3578	98	0,7430
9	0,0063	39	0,1177	69	0,3684	99	0,7584
10	0,0077	40	0,1238	70	0,3791	100	0,7727
11	0,0094	41	0,1300	71	0,3900	101	0,7873
12	0,0112	42	0,1364	72	0,4011	102	0,8050
13	0,0131	43	0,1430	73	0,4124	103	0,8209
14	0,0152	44	0,1498	74	0,4238	104	0,8369
15	0,0174	45	0,1568	75	0,4353	105	0,8530
16	0,0198	46	0,1639	76	0,4469	106	0,8693
17	0,0223	47	0,1711	77	0,4588	107	0,8858
18	0,0256	48	0,1784	78	0,4708	108	0,9024
19	0,0279	49	0,1858	79	0,4830	109	0,9192
20	0,0208	50	0,1923	80	0,4953	110	0,9361
21	0,0341	51	0,2012	81	0,5077	111	0,9532
22	0,0374	52	0,2092	82	0,5203	112	0,9705
23	0,0409	53	0,2173	83	0,5331	113	0,9880
24	0,0445	54	0,2256	84	0,5460	114	1,0056
25	0,0484	55	0,2340	85	0,5591	115	1,0233
26	0,0523	56	0,2426	86	0,5725	116	1,0411
27	0,0564	57	0,2514	87	0,5857	117	1,0591
28	0,0606	58	0,2603	88	0,5992	118	1,0772
29	0,0650	59	0,2693	89	0,6129	119	1,0955
30	0,0696	60	0,2785	90	0,6268	120	1,1140

Inches of the Diameter.

Thus a round Tun whose Diameter or breadth is 10 foot, or 120 inches, the content for one inch depth is, 1, 1140. that is one Barrel, and 1140. parts. Now if this Tun or the liquor in it be 10 inches deep, then the content thereof is 10 times as much, that is 11, 1400. If it be 20 inches deep, then it is 20 times as much; that is, 22, 2800, and so for any other depth, you must multiply the number found in the Table by the inches of the depth.

But if these Tuns be Comical, that is, narrower at the top than at the bottom, you may take the measure of the Diameter at the middle of the Tun, and finde the content by the Table, as before. But this Content will be somewhat less than it should be, and yet no great matter, if the sloaping of the Tun be not much, and the depth not much neither.

But if you will be more exact, you may take the Diameter of the Tun in 2 or 3 places, at every two or three foot of depth, and so finde the content thereof at two or three times, as I shewed before in the measuring of tapering-Timber-page

If you will yet be more exact, you may use Mr. Oughtreds way of measuring tapering Timber, which is thus.

First finde the content of the Bases at both

(26.)

both ends, and multiply the one by the other, and out of the product thereof extract the square root: then adde together the foresaid content of both the Bases, and that square root, and multiply the summe thereof by a third part of the height or depth, and the product thereof shall give the content desired.

Example.

Let there be a Tun 5 foot or 60 inches deep, the Diameter at the bottom 100 inches, the Diameter at the top 80 inches, the content whereof is to be found.

First, you may finde the content of the Bases by the Table. Thus the Diameter at the bottom being 100 inches, the content thereof is, 0,7737. And the Diameter at the top being 80 inches, the content thereof is 0,4953. Now for the multiplying of these two Bases together, and finding the square root thereof, you may much help your self by the Table of Logarithms, working in this manner.

The

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	B. parts.	Logarithm.
The Base at bottom,	0,7737	0,888572
The Base at top,	0,4953	0,694868

The sum. 1,583441

The half of this } 0,6190 0,791720
is the Logarithm of }
the square root } _____

The sum of the 2 Bases, } 1,8880
and this root is }
which multiplied by a 3d. 20. inches.
of the depth _____

Shews the Content 37,7600

This is the true and exact content hereof, whereas if you should measure this Tun by the Diameter at the middle thereof, which is 90 inches; the Table shews the content for one inch, to be 0,6268. which multiplied by the depth 60 inches, it will yield for the content only 37, 6080, which is short of the true content, 0,1520. which yet is no great matter, being but 5 Gallons and an half in a Vessel of 37 Barrels.

Lastly, if you measure the Diameter hereof in the midst between the top and the middle, and the bottom, and the middle, as I said before,

So

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arithm. So the upper or lesser Diameter will be
88572 14 inches, for which the Table gives 0,5591
9486 which multiplied by 30 inches depth, 30

83441 Yields for the content 16,7730

791720 And the lower Diameter is 95 }
inches, which in the Table yields } 0,6982
which multiplied by 30 inches deep, 30
yields for the content

20,9460

hes. The sum of both which together is 37,7190

hereof, Which is but 410 parts short of the true
Tun by content found by the most exact way, which
which is but a Gallon and half short, in 37 or
content 38 Barrels.

multi- Last of all, I finde some take the Diame-
yield ter in the midst of every foot, and so reckon
which is how much every inch deep in that foot
which holds.

Gallons Thus the Diameters and content for the
five several feet of this Tun will be thus.

meter
and the
middle,

So

Diam.

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	B. parts.	Logarithm.
The Base at bottom,	0,7737	0,888572
The Base at top,	0,4953	0,694861
The sum.		<u>1,583441</u>
The half of this } is the Logarithm of } the square root }	0,6190	0,791720
The sum of the 2 Bases, } and this root is }	1,8880	
which multiplied by a 3d.		20. inches.
of the depth		<u>37,7600</u>
Shews the Content		37,7600

This is the true and exact content hereof, whereas if you should measure this Tun by the Diameter at the middle thereof, which is 90 inches; the Table shews the content for one inch, to be 0,6268. which multiplied by the depth 60 inches, it will yield for the content only 37, 6080, which is short of the true content, 0,1520. which yet is no great matter, being but 5 Gallons and an half in a Vessel of 37 Barrels.

Laſtly, if you measure the Diameter hereof in the miſt between the top and the middle, and the bottom, and the middle, as I ſaid before,

So

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So the upper or lesser Diameter will be
14 inches, for which the Table gives 0,5591
which multiplied by 30 inches depth, 30

Yields for the content 16,7730

And the lower Diameter is 95 }
inches, which in the Table yields } 0,6982
which multiplied by 30 inches deep, 30
yields for the content

20,9460

The sum of both which together is 37,7190

Which is but 410 parts short of the true
content found by the most exact way, which
is but a Gallon and half short, in 37 or
38 Barrels.

Last of all, I finde some take the Diame-
ter in the midst of every foot, and so reckon
how much every inch deep in that foot
holds.

Thus the Diameters and content for the
five several feet of this Tun will be thus.

Diam.

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	<i>Diam.</i>	<i>the Inch.</i>	<i>the Foot.</i>
1	82	0,5203	6,2436
2	86	0,5723	6,8676
3	90	0,6262	7,5216
4	94	0,6836	8,1032
5	98	0,7430	8,9160

The Content in all

37,7520

which wants but 240 parts, which is not one Gallon of the true content.

There remains now only the casting up, of what is due for the Excise, in which this Table will direct you.

A Table

The number of Barrels.

A

Table of the Excise to be paid for Beer
and Ale.

	Strong Ale is to pay 2l. 10s. the Score, reckoning 22 Barrels to the Score.				Strong Beer is to pay 2l. 10s. the Score, reckoning 23 Barrels to the Score.				Small Beer is to pay 10s. the Score, reckoning 23 Barrels to the Score.			
	li.	sh.	d.	q.	li.	sh.	d.	q.	li.	sh.	d.	q.
1	00	02	03	1	00	02	02	0	00	00	05	0
2	00	04	06	2	00	04	04	0	00	00	10	1
3	00	06	09	3	00	06	06	1	00	01	03	2
4	00	09	01	0	00	08	08	1	00	01	08	3
5	00	11	04	1	00	10	10	1	00	02	02	0
6	00	12	07	2	00	13	00	2	00	02	07	1
7	00	15	10	3	00	15	02	2	00	03	00	2
8	00	18	02	0	00	17	04	2	00	03	05	3
9	01	00	05	1	00	19	06	3	00	03	10	3
10	01	02	08	2	01	01	08	3	00	04	04	0
20	02	05	05	1	02	03	05	2	00	08	08	1
30	03	08	02	0	03	05	02	2	00	13	00	2
40	04	10	10	3	04	06	11	1	00	17	04	2
50	05	13	07	2	05	08	08	0	01	01	08	3
60	06	16	04	1	06	10	05	0	01	06	01	0
70	07	19	01	0	07	12	01	3	01	10	05	0
80	09	01	09	3	08	13	10	2	01	14	09	1
90	10	04	06	2	09	15	07	2	01	19	01	2
100	11	07	03	1	10	17	04	1	02	03	05	3
200	22	14	06	2	21	14	08	2	04	06	11	2
300	34	01	09	3	32	12	00	3	06	10	05	1
400	45	09	01	0	43	09	05	3	08	13	11	0
500	56	16	04	1	54	06	09	1	10	17	04	3
600	68	03	07	2	65	04	02	2	13	00	10	2
700	79	10	10	3	76	01	05	3	15	04	04	1
800	91	08	02	0	86	18	10	3	17	07	10	0
900	102	05	05	1	97	16	02	1	19	11	03	3
1000	113	12	05	2	108	13	06	2	21	14	09	2

The number of Barrels.

Of Weights.

THere are two sorts of weights used by us in *England*, the one is called Troy weight, the other is called Avoir-du-poids, or over-weight. Troy weight is thus ordered by the Statute, but yet the Standard weights are the surest trial of them.

24 grains of Wheat make a penny weight.

20 penny weights make an ounce.

12 ounces make a pound.

So there is 480 grains in the ounce, and 5760 grains in the pound.

By this weight Silver and Gold are constantly weighed, and the Assize of Bread is set down in the Statutes according to this weight.

Also the Apothecaries either do, or should use this weight, only they divide the ounce into other parts and denominations, viz.

20 Grains make a Scruple,	}	20 gr.
3 Scruples make a Drachme,		60 gr.
8 Drachmes make an Ounce,		480 gr.
12 Ounces make a pound.		5760 gr.

So that in this ounce, there is also 480 Grains, and therefore it must needs be the same with the Troy Ounce, though many Authors mistake this Ounce for the Avoir-du-

du-poize ounce, which should have been more heedful therein.

Among the rest, Mr. *John Penkethman* in his Book of the Assize of Bread, reckons the part of the Avoir-du-poize weight thus, 20 Grains make a Scruple, 3 Scruples a dram, 8 Drains an Ounce, 16 Ounces a Pound. This mistake of his, and the like of others, led me into the like in my former Editions. But the best is, that he calculates his Tables upon a better observation, making 73 Ounces Troy, to be equal in weight with 80 Ounces Avoir-du-poize.

And if you go to work by this observation, and the *Reverse* or *Back-rule* of *Proportion*, you shall finde,

As 73 to 80, so 480 to 438.

So that if the Troy ounce have 480 grains, the Avoir-du-poiz Ounce must have but 438 grains.

And this is the ordinary received proportion between the Troy-weight, and the Avoir-du-poiz, viz. 60 pounds Avoir-du-poiz are equal to 73 pounds Troy. And that 73 ounces Troy are equal to 60 Ounces Avoir-du-poiz. From which proportion Doctor *Wyband's* Experiment differs a little, making 14 li. Avoir-du-poiz to be equal to 17 li. Troy weight; and 51 ounces Troy, to be equal to 56 ounces Avoir-du-poiz.

So

So that the ounce Troy is greater than the ounce Avoir-du-poiz, but the Troy pound is lesser than the pound Avoir-du-poiz.

But now for the parts and denomination of the Avoir-du-poiz weight, we must finde out some other rule, and I observe it is the nature of this weight, to take the whole great weight, which is either the Hundred Pound, or Ounce (for the first foundation) and so to go downward, lessening still by half.

Thus the first great weight being 112 pounds, is called the Hundred.

The half of this being

- 56 pounds is called the half hundred.
- 28 pounds is the quarter of the hundred
- 14 pounds half a quarter.
- 7 pounds.
- 4 pounds.
- 2 pounds.
- 1 li. is called one pound.
- half a li. is half a pound.
- one quarter of a li. is a quarter.
- one eighth of a li. is half a quarter.
- one sixteenth is called an ounce.
- half an ounce.
- a quarter of an ounce.
- one eighth of an ounce is half a quarter.
- one sixteenth of an ounce is called a Dram.

So that there is 16 Drams in an Ounce, and 16 ounces in the pound. And with these weights, you may weigh any thing from 1 C. weight to a Dram, which you cannot well do with fewer.

There are some other denominations, of these weights in several places, as Stones, Cloves, Tods, Roovers, Weights, Loads, Fother, Tuns, but they are all reduced into these weights, and regulated thereby.

According to these Observations, I have corrected these Tables of the Assize of Bread, which are thus to be used.

The manner of using these Tables of Bread.

First, you must consider the price of Wheat in the Market, which must neither be of the best, or worst, but of the midling sort and price. Then you must consider whether the Baker be a Free-man of the City or Corporation Town or not; for Free-men are allowed two shillings more upon the quarter, which is three pence in the Bushel more for profit, than others which are not Free: the one being allowed six shillings in a quarter, the other but four. These allowances are already abated for, in these Tables, so that without any farther allowance, finde the price of Wheat on the one side

side of the Table for *for* Bakers, or on the other side for Forreigners, and in the middle you have the several weights, of the penny White, Wheaten, and Household Loaves.

And the Law is very strict against Bakers in case of offending. For if the Major or Bailiff finde their Bread too light, they may take it away and give it to the poor of the Town, or Parish. And by the Statute of *Hen. 3. 51.* and *Eliz. 31.* If a Baker want but one Ounce in 36 of this Assize, for the first, second, and third fault, he may be amerced; but for the fourth fault he is to be set in the Pillory without redemption.

A Table of the Price of Bread by Troy weight.

12 ounces Weight of a penny Loaf. 30 penny w. in one li. White. Wheat. Housh. in one ounce

lb.	oz.	d.	oz.	d.	oz.	d.	lb.	d.
2	0	15	07	23	01	30	15	2 3
2	3	14	02	21	03	28	0	2 6
2	6	13	00	19	10	26	00	2 9
2	9	12	01	18	03	24	03	3 0
3	0	11	05	16	18	22	11	3 3
3	3	10	11	15	17	21	03	3 6
3	6	9	19	14	18	19	18	3 9
3	9	9	08	14	02	18	16	4 0
4	0	8	18	13	07	17	16	4 3
4	3	8	09	12	13	16	18	4 6
4	6	8	01	12	01	16	02	4 9
4	9	7	13	11	10	15	07	5 0
5	0	7	07	11	00	14	14	5 3
5	3	7	01	10	11	14	02	5 6
5	6	6	15	10	03	13	10	5 9
5	9	6	10	9	15	13	00	6 0
6	0	6	05	9	08	12	10	6 3
6	3	6	00	9	01	12	01	6 6
6	6	5	16	8	15	11	03	6 9
6	9	5	12	8	09	11	05	7 0
7	0	5	09	8	03	10	18	7 3
7	3	5	05	7	18	10	11	7 6
7	6	5	02	7	13	10	05	7 9
7	9	4	19	7	09	9	19	3 0
8	0	4	16	7	05	9	13	3 3
8	3	4	14	7	01	9	08	3 6
8	6	4	11	6	17	9	02	3 9
8	9	4	9	6	13	8	18	9 0
9	0	4	6	6	10	8	13	9 3
9	3	4	4	6	06	8	09	9 6
9	6	4	2	6	03	8	05	9 9
9	9	4	0	6	00	8	00	10 0

The price of the Bushel of wheat for Foreigners.

The price of the Bushel of Wheat for Free Town-Bakers.

*A Table of the Assize of Bread by Avoir-du-
poiz weight.*

16 ounces weight of a penny Loaf. 16 drams
in the li. White. Wheat. Housh in an ounce

	lb. d.		oz. d.		oz. d.		oz. d.		lb. d.	
	—	—	—	—	—	—	—	—	—	—
	2	6	16	13	25	02	33	11	2	3
	2	3	15	07	23	03	30	14	2	6
	2	6	14	04	21	01	28	08	2	9
	2	9	13	03	19	12	26	07	3	0
	3	0	12	05	18	05	24	11	3	3
	3	3	11	09	17	06	23	03	3	6
	3	6	10	14	16	05	21	13	3	9
	3	9	10	05	15	07	20	09	4	0
	4	0	9	12	14	10	19	08	4	3
	4	3	9	04	13	14	18	08	4	6
	4	6	8	13	13	04	17	10	4	9
	4	9	8	07	12	15	16	14	5	0
	5	0	8	01	12	01	16	02	5	3
	5	3	7	11	11	09	15	07	5	6
	5	6	7	06	11	02	14	13	5	9
	5	9	7	02	10	11	14	04	6	0
	6	0	6	14	10	04	13	11	6	3
	6	3	6	08	9	15	13	04	6	6
	6	6	6	06	9	09	12	12	6	9
	6	9	6	03	9	04	12	06	7	0
	7	0	5	15	8	15	11	15	7	3
	7	3	5	12	8	11	11	09	7	6
	7	6	5	09	8	06	11	03	7	9
	7	9	5	07	8	03	10	14	3	0
	8	0	5	04	7	15	10	09	8	3
	8	3	5	02	7	12	10	05	8	6
	8	6	5	00	7	08	10	00	8	9
	8	9	4	14	7	05	9	12	9	0
	9	0	4	12	7	02	9	08	9	3
	9	3	4	10	6	15	9	04	9	6
	9	6	4	08	6	12	9	00	9	9
	9	9	4	06	6	10	8	13	10	0

The price of the Bushel of Wheat for Free Town-Bakers.

The price of the Bushel of wheat for Foreigners.

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Of Liquid or wet Measures.

THere are four Measures for Liquid things in most use, the Pint, the Quart, the Pottle, and the Gallon. Other greater things being more properly vessels to hold Liquor, than to measure it. These are either doubled from the lesser, or halved from the greater, so that

Two Pints make a	}	or	}	half a Gallon is
Quart,				a Pottle.
Two Quarts make				half a Pottle is a
a Pottle,				Quart.
Two Pottles make				half a Quart is a
a Gallon.				Pint.

Or more fully thus.

	Pints	Quarts.	Pottles.
In one Gallon are	8	4	2
Pottle	4	2	1
Quart	2	1	0

I shewed before there is such a difference in these Measures for Beer and Wine, as there is between 4 and 5, so that 4 Gallons of Beer measure is 5 of Wine measure.

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The price of the Busket of wheat for Foreigners.

Now our Beer and Ale is usually reckoned, and sold by Barrels, Kilderkins, and Firkins.

If you would know how many Gallons, Quarts, or Pints are in any of these, these Tables will shew you.

For Beer Vessels.

	<i>Pints.</i>	<i>Quarts.</i>	<i>Pottles.</i>	<i>Gallons.</i>
A Barrel is	288	144	72	36
A Kilderkin is	144	72	36	18
A Firkin is	72	36	18	9

For Ale Vessels.

A Barrel holds	256	128	64	32
A Kild. holds	128	64	32	16
A Firkin holds	64	32	16	8

But this you may see, that as the Proverb saith, *Many hands* (so many mouths) *make quick work*. For there being but 118 quarts in a Barrel of Ale, 144 quarts in a Barrel of Beer, a Company of Souldiers which are usually 130 or 140 men, may very well drink it up, it being but each man his quart. And by this you may in some sort know what will furnish a greater Army, or Navy. For a Man of War having 250 men aboard, spends a Tun of Beer every day, each man being allowed his Kan, which is about a wine Gallon.

Wine Vessels with their Contents are thus.

	Pints.	Quarts,	Pot.	Gall.
A Tun is	2016	1008	504	252
A Pipe or But	1008	504	252	126
A Punchion	672	336	168	84
H Hoghead holds	504	252	126	63
A Tierce of a Pipe	336	168	84	42
Half Hoghead	252	126	63	31½
A Rundlet holds	144	72	36	18

It is commonly thought, that a Pint of Wine or Water weigheth a pound Troy, but it will be found rather to weigh a pound Avoir-du-poiz. For Doctor *Wybard* having two or three experiments about this, by the Standard-Gallon at *Guild-Hall*, found that the Wine-Gallon of Water weighed 8 li. 1 ounce, 12 Drams by Avoir-du-poiz weights at *Guild-Hall*, whereas it weighed 9 pound 10 ounces, 1 Dram, 1 quarter by the Troy weights at *Goldsmiths-Hall*. So that a pint of water is 1 pound and a quarter of an ounce by Avoir-du-poiz. But by other mens observations it is found somewhat above, viz. that a pint of Wine should weigh one pound, and about half an ounce, yet Wine is somewhat lighter than Water, as there is also some difference in the weight of waters though not much.

And according to some Observations this

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way,

way, methinks the Content of a Vessel might in some sort (though not altogether so exactly) be known, as well as by Gauging.

To this end take these Observations, which were given me, and you may make trial and use of them as you finde them.

<i>Names of the Vessels.</i>	<i>Wine Gallons</i>	<i>Tare C. q. li.</i>	<i>Weight. C. q. li.</i>
Rundlet contains	18 $\frac{1}{2}$	0 0 23	1 1 14
Beer Barrel	45	0 2 03	1 1 11
Half Hogsheed	31 $\frac{1}{2}$	0 1 23	2 1 11
Tierce	42	0 2 14	3 0 14
Rochel Hogsheed	46	0 2 17	3 1 20
High-Countrey Hogsheed	54	0 2 27	4 0 6
Graves Hogsheed	63	0 3 64	4 2 22
Punchion	84	0 3 22	6 1 2
Maligo But	112	1 0 18	8 1 12
Canary Pipe	116	1 0 20	8 2 17
Malmsby Butt	126	1 1 09	1 1 17

This may be further improved by considering the weight of other things compared together, which I finde thus set down in *Gerard Malynes, in Mercatoria, pag. 30.*

The

		li.
	Of Wine, or rain water	50
	Of River-water	53
The <i>Amphora</i>	Of Oyl or Butter	45
of the <i>Romans</i>	Of Beans and Pease	35
weights in <i>Ant-</i>	Of Linseed Oyl	39
<i>werp</i> weights,	Of Corn	40
whereof 112l.	Of Almonds	42
at <i>London</i>	Of Raisins	49
makes 107 $\frac{5}{8}$ at	Of Figs and Chestnuts	67
<i>Antwerp</i> .	Of Honey	75
	Of Quick-silver	850

Of Dry Measures.

Corn or Grain is measured by Gallons; but this Gallon is neither the Wine Gallon nor the Ale Gallon; but in the midst between both, they being in proportion as 28, 33, 35. The common names and content of the Measures of these things are thus.

	<i>A Last.</i>	<i>Quar.</i>	<i>Cornook.</i>	<i>Strike.</i>	<i>Bussh.</i>
<i>Pints</i>	5120	512	256	128	64
<i>Quarts</i>	2560	256	128	64	32
<i>Pottles</i>	1280	128	84	32	16
<i>Gallons</i>	640	64	32	16	8
<i>Pecks</i>	320	32	16	8	4
<i>Busshels</i>	80	8	4	2	1
<i>Strikes</i>	40	4	2	1	
<i>Cornooks</i>	20	2	1		
<i>Quarters.</i>	10	1			

M 3

By

By this you may see that 500 men, may very well spend a quarter of Wheat every day, it being but about a li. for each man. And a Regiment of Horse being about 600 may spend a Last, or ten Quarters of Oats every day, it being but little above a Gallon, or half a Peck for each Horse, viz. 640 Gallons. By this a Governor of a Castle may guess, how to furnish a place with these things, to hold out any time; or may know how long he is able to hold out, with the Provision he hath.

Sea Coals and Salt are also measured by these Pecks and Bushels, but then they are either heaped, or else there is allowed five striked Pecks to the Bushel, and this is called water-measure. Thirty and six such heaped Bushels are a Chaldron of Coals; yet on Shipboard they allow 21 Chaldron to the Score.

Observations about Gold, Silver, and other Mettals.

[*Gold is the most worth of any Mettal.*

The worth of Gold.

Of

Of Gold.		li.	s.	d.	q.
One pound weight	} Troy is worth.	40	0	0	0
One ounce		3	6	8	0
One penny-weight		0	3	4	0
One Grain.		0	0	1	2

This is the price of ordinary Gold.

Angel Gold is worth somewhat more, and
Sovereign Gold somewhat less.

The worth of Silver.

		li.	s.	d.	q.
One pound weight	} Troy is worth	3	0	0	0
One Ounce		0	5	0	0
One penny-weight		0		3	0
One Grain		0	0	0	0

But of English Coin.

		li.	s.	d.	q.
Of Gold	One pound Troy	40	18	4	3
Of Silver	weight is worth	3	2	0	0

And by proportion.

Of Gold	One pound weight	49	13	8	1
Of Silver	Avoir-du-poiſ	3	1	3	2

By this account 100l. pound of Silver money
weighs 26li. 9 ounces Avoir-du-poiſ.

And 100l. in Gold weighs fully two
pounds Avoir-du-poiſ, and about a quarter
of an Ounce over.

As Gold is more worth, so it is more weighty
than any other Metall. So that if you

should cast 7 Bullets of these several Metals, their weights will have this proportion one to the other.

Gold	10000	Silver	5437
Quick- silver }	7143	Brass	4737
Lead	6053	Iron	4210
		Tin	3895

Hence there may be a good Experiment for the Trial of counterfeit Gold. For Gold being heavier than Lead by about a third part, and heavier than Silver by about an half, no counterfeit pence can be made of these or any Metals which are lighter, but the difference may be discerned, and suspected either by the breadth or thickness.

But if this difference be not thus discerned or only suspected, you may make a more certain trial by weighing it in the water, as *Archimedes* did the golden Crown.

For this is a sure rule in the Art Statick, that every thing being in the water, doth lose so much of his proper weight, as the quantity or bulk of so much water doth weigh: so that Gold being scarce half the quantity of Brass or Silver, doth scarce lose half so much of its weight in the water, as Silver or Brass will. As you may see plainly by weighing a twenty shillings piece against his Brass weight in the water; let the scales be made to stand never so equal with them

thrust out of the water; yet put them in a small of water, and weigh them there, and

Gold will weigh 10 or 12 grains heavier than the brass weight.

And this putting of things into water may be of good use to measure small irregular Bodies. For either by the rising of the water in the Vessel, or by the over-flowing of the water, and weighing it, or rather measuring it in a fit vessel of some regular form, you may know the true quantity of the thing you desire.

And if the body to be measured be great, you may make a little model thereof, allowing an inch, or a quarter of an inch for every foot. And thus you may know the burden or weight of any Ship.

If you want a fit vessel to measure the water in, you may make use of Dr. Wybard's Experiment concerning the weight of water, viz.

In Inch Measure.

The ounce Troy of water, is one inch 8949 parts, of solid measure.

The ounce Avoir-du-poiz, is one inch 72556 parts.

In foot Measure.

The ounce Troy of water is 0,001096.

The ounce Avoir-du-poiz, is 0,00099859

In

In Inch Measure.

The pound Troy of Water, is	<i>Inch. Parts</i> 22.7368.
The pound Avoir-du-poiiz, is	27.609.

In foot Measure.

The pound Troy of water is	<i>F. Parts</i> 0,013158
The pound Avoir-du-poiiz, is	0,115917

A foot square of water is 912 ounces Troy weight, which is 76 li. Troy. And the same in Avoir-du-poiiz weight is 62 li. 588 parts, which is 62 li. 9 ounces, 6 Drains, and an half.

And though there may be some difference between Rain Water, River Water, and Fountain Water, yet the difference is not so much as *Saellius* makes it, viz. as 1000000 to 1007522. But the greatest difference *Dr. Wybard* could finde, trying by several waters, was only as 1000000 to 1002104, being about 2 in 1000.

• There is one Experiment more, concerning the finding of the time of the day, by those metals, which is approved of by the experience and judgment of many.

Having a Gold Ring and a Silver drinking Boul, take a small thred or silk, and measure the compass of the top of the silver Boul, which will be a convenient length for your use: then put this thred through
the

the Ring, and tie the ends thereof together, taking up as little as you can with the knots. Put this thred over your thumb, so that it may hang upon the lower jaynt of your thumb where you feel the Pulse beat; Then stretch out your hand, and hold it so that the inside of your thumb may be upward, and hold your hand so over the Boul, that the Ring may hang as near the midst of the Boul as you can guess. And thus holding your hand a while, as still as you can, you shall see that the beating of your Pulse will give a motion to the Ring, causing it to swing cross the Boul by degrees more and more, till at last it will beat against the sides thereof: Now mark when it begins to strike, and tell the strokes as you would a Clock, for it will strike what hour of the day or night it is, and then leave off striking, and swinging also by degrees.

A Table of Multiplication :
Or,
Arithmetical proportion.

A

A Table of Arithmetical Proportions.

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100
11	22	33	44	55	66	77	88	99	110
12	24	36	48	60	72	84	96	108	120
13	26	39	52	65	78	91	104	117	130
14	28	42	56	70	84	98	112	126	140
15	30	45	60	75	90	105	120	135	150
16	32	48	64	80	96	112	128	144	160
17	34	51	68	85	102	119	136	153	170
18	36	54	72	90	108	126	144	162	180
19	38	57	76	95	114	133	152	171	190
20	40	60	80	100	120	140	160	180	200
21	42	63	84	105	126	147	168	189	210
22	44	66	88	110	132	154	176	198	220
23	46	69	92	115	138	161	184	207	230
24	48	72	96	120	144	168	192	216	240
25	50	75	100	125	150	175	200	225	250
26	52	78	104	130	156	182	208	234	260
27	54	81	108	135	162	189	216	243	270
28	56	84	112	140	168	196	224	252	280
29	58	87	116	145	174	203	232	261	290
30	60	90	120	150	180	210	240	270	300
31	62	93	124	155	186	217	248	279	310
32	64	96	128	160	192	224	256	288	320
33	66	99	132	165	198	231	264	297	330
34	68	102	136	170	204	238	272	306	340
35	70	105	140	175	210	245	280	315	350

A Table of Arithmetical Proportions.

1	2	3	4	5	6	7	8	9	10
36	72	108	144	180	216	252	288	324	360
37	74	111	148	185	222	259	296	333	370
38	76	114	152	190	228	266	304	342	380
39	78	117	156	195	234	273	312	351	390
40	80	120	160	200	240	280	320	360	400
41	82	123	164	205	246	287	328	369	410
42	84	126	168	210	252	294	336	378	420
43	86	129	172	215	258	301	344	387	430
44	88	132	176	220	264	308	352	396	440
45	90	135	180	225	270	315	360	405	450
46	92	138	184	230	276	322	368	414	460
47	94	141	188	235	282	329	376	423	470
48	96	144	192	240	288	336	384	432	480
49	98	147	196	245	294	343	392	441	490
50	100	150	200	250	300	350	400	450	500
51	102	153	204	255	306	357	408	459	510
52	104	156	208	260	312	364	416	468	520
53	106	159	212	265	318	371	424	477	530
54	108	162	216	270	324	378	432	486	540
55	110	165	220	275	330	385	440	495	550
56	112	168	224	280	336	392	448	504	560
57	114	171	228	285	342	399	456	513	570
58	116	174	232	290	348	406	464	522	580
59	118	177	236	295	354	413	472	531	590
60	120	180	240	300	360	420	480	540	600
61	122	183	244	305	366	427	488	549	610
62	124	186	248	310	372	434	496	558	620
63	126	189	252	315	378	441	504	567	630
64	128	192	256	320	384	448	512	576	640
65	130	195	260	325	390	455	520	585	650
66	132	198	264	330	396	462	528	594	660
67	134	201	268	335	402	469	536	603	670
68	136	204	272	340	408	476	544	612	680
69	138	207	276	345	414	483	552	621	690
70	140	210	280	350	420	490	560	630	700

A Table of Arithmetical Proportions.

1	2	3	4	5	6	7	8	9	10
71	142	213	284	355	426	497	568	639	710
72	144	216	288	360	432	504	576	648	720
73	146	219	292	365	438	511	584	657	730
74	148	222	296	370	444	518	592	666	740
75	150	225	300	375	450	525	600	675	750
76	152	228	304	380	456	532	608	684	760
77	154	231	308	385	462	539	616	693	770
78	156	234	312	390	468	546	624	702	780
79	158	237	316	395	474	553	632	711	790
80	160	240	320	400	480	560	640	720	800
81	162	243	324	405	486	567	648	729	810
82	164	246	328	410	492	574	656	738	820
83	166	249	332	415	498	581	664	747	830
84	168	252	336	420	504	588	672	756	840
85	170	255	340	425	510	595	680	765	850
86	172	258	344	430	516	602	688	774	860
87	174	261	348	435	522	609	696	783	870
88	176	264	352	440	528	616	704	792	880
89	178	267	356	445	534	623	712	801	890
90	180	270	360	450	540	630	720	810	900
91	182	273	364	455	546	637	728	819	910
92	184	276	368	460	552	644	736	828	920
93	186	279	372	465	558	651	744	837	930
94	188	282	376	470	564	658	752	846	940
95	190	285	380	475	570	665	760	855	950
96	192	288	384	480	576	672	768	864	960
97	194	291	388	485	582	679	776	873	970
98	196	294	392	490	588	686	784	882	980
99	198	297	396	495	594	693	792	891	990
100	200	300	400	500	600	700	800	900	1000

The

The description and use of the Table of Arithmetical Proportions.

I May well call it thus, because it is useful in all the parts of Arithmetick; but especially in *The Rule of Proportion*, commonly called, *The Rule of Three*.

First, It is a plain Table of Multiplication, and that not only of the digit Numbers, 1, 2, 3, 4, &c. to 10, (which is usual but to an 100. And if you reckon the single figures at the top of the Table to stand for 10, 20, 30, 40, and 100, and put, or suppose a Cypher to the numbers under them, the Table will reach to 100 square. Thus, at the beginning of the Table you may reckon,

As 8 times 8 is 64, so 8 times 80 is 640.

Or at the end of the Table.

As 80 times 8 is 640, so 80 times 80 is 6400

The order of working by this Table, is as in most others, to finde the one of your numbers on the side of the Table, and the other at the head, and in the square of these two you shall finde the product. And thus you shall finde the multiplication of any two numbers.

numbers under 100, if the one of them have a cypher after it. But now at other times you must make two entrances for it, and so add them together.

Suppose the Roof of an house to be 12 foot and an half broad, on the one side (and so 25 foot on both sides the ridge) and 48 long, how many feet in all? and so how many squares of ten foot square therein? and how many Tiles will cover it.

To multiply the breadth,	25 feet.
By the length,	48 feet.
First, 8 times 25 is	200
And 4, or rather 40 times 25 is	1000
	<hr/>
The whole Sum is	1200 feet.

Now their square being ten feet every way, contains 100 feet in the whole, so that cutting off the two last figures, You have 12 squares of Tyling.

Now if you lay your Tyles but 3 inches out, then 800 Tyles will cover one square. But if you lay them 3 inches and an half out (as you may, but must not exceed that) then 750 Tyles will cover one square. Now if 750 Tyles cover one square, how many will cover the whole house, being 12 square?

First,

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have First, you shall finde 2 times 750 is 1500
times then 10 times 750 is 7500

and so In all 9000
be 11 And so many ryles will cover the whole
e (and use.

nd 48 In like manner, if you know how many
o how Bricks will make a foot, or a yard, or a rod
rein? a Wall of one, two, or three Bricks thick,
you may easily cast up how many 1000 will
ild an house, or make a wall round about
5 feet. Orchard, or a Park. And if you know
8 feet. how much Mortar will lay 1000 Bricks,
o and how many Bricks a Workman can lay
o a day, you may easily count the charge
Building of such an House, or Wall.

o feet. Suppose 4500 Bricks will make a Rod
every square of a Wall, whose thickness shall be
o that 12 Inches, or a Brick and an half thick. How
many then will build an House, whose
height is 3 Rod, and the compass thereof
1 Rods.

inches First, multiply 3 by 12, and it makes 36 Rods
square. in all, and multiply this by 4500

n half 5 times 36 is 18000
that) 4 times 36 is 144

.Now adding them in their places }
many and adding the Cyphers }
g 12 }
First, }
gain, it makes 162000

Take

Take a question or two of another nature:

A Captain is to receive 60 dayes, or two moneths pay for his Souldiers, being 69 in number, how much will it come to at 8d. a man every day?

This must be all brought first into 8 pences, thus.

You may see by the Table that 69 times 6 is 576, so that 96 times 60, is 5760 eight pences, which you may easily reckon up by the following Table of accounts to be 1928.34

Many such questions may be answered by this Table, but you shall see that it may be useful to those who are more skilful in multiplication, running over the work by two figures at once, and by careful ordering the figures, avoid much, or all of the carrying, which is troublesome in the ordinary way: as you may see by these few examples.

$$\begin{array}{r}
 28.34 \\
 \underline{\quad 9 \quad} \\
 306 \\
 252 \\
 \underline{\quad \quad} \\
 25506
 \end{array}$$

$$\begin{array}{r}
 19.28.34 \\
 \underline{\quad 89 \quad} \\
 171 \quad 306 \\
 252 \\
 \underline{\quad \quad} \\
 152 \quad 272 \\
 224 \\
 \underline{\quad \quad} \\
 17161226
 \end{array}$$

nature: The like helps you may finde in Divi-
 or two
 g 69 is if you would know how many shil-
 t 8d. are in 108 pence, you must divide this
 8 pen- ber by 12, which are the pence in one
 9 times shag, which you shall do by finding 12
 o eight the side of the Table, and running along
 n up by the line till you finde the said number
 e 191 and this is just under nine, so that it
 ered by there is just 9 shillings in 108 pence.
 may be now if this number had a Cypher after
 in mul- 1080, then it had been 90 shillings.
 by two like manner, if you would know how
 ndering Acres are in a piece of Land, whose
 of the you finde to be 1440 poles. Here
 he ordi- 160 Poles in one Acre; you must di-
 few ex- vide this number by 160, which because it
 in the Table, leave out the cypher, and
 the number 16, and in this line you
 finde 144, which by adding your cy-
 again, makes 1440 under 9, so that
 are nine Acres in the said field.
 Now though money will be better redu-
 by the following Table of Accounts, yet
 you have occasion for some such common
 1000s, you may make a Table of them. |
 the chiefest use of this Table will ap-
 in the *Rule of Proportion*, commonly
 the *Rule of Three*, wherein after the
 any way, you must work first by Divisi-
 The on

on, and then by *Multiplication*, but by the Table many useful Propositions may be formed, by inspection only, without either of them, and the four numbers will fall in a square posture in the Table.

To this purpose, first finde your first number on the side of the Table; and finde your second-number in the same line with it, observing well in which of the Columns it happens; then finde your third Number likewise on the side of the Table under the first number, and in that line, in the Column where your second number was found, you shall finde the fourth number which is the thing desired.

Thus you shall finde that,

As 10 to 60, so 25 to 150.

which is thus wrought by the Table.

As 10 } in the side } to 60 } in the first
So 25 } of the table } to 150 } Column.

The like proportion you shall finde though you take your first and third Numbers, not in the first, but in any other Column.

Thus you shall finde in the beginning of the Table.

As 60 } in the } to 100 } in the
So 48 } sixth Co- } to 80 } last Co-
Or 36 } lumne } to 60 } lumne.

And thus if you leave out the last figure

two Columns, or rather count them
 decimal Fractions, they will be a very
 Table of reduction between Sexagesimi-
 and Centesimal parts, for the propor-
 will hold either forwards or backwards,

in the } to 6,0 } in the
 tenth Co- } to 12,0 } sixth Co-
 lumne } to 18,0 } lumne

also, if you change the places of your
 and third numbers, the conclusion
 be the same, both the ordinary way by
 Arithmetick, and by this Table also, yea,
 you finde them in any other Co-
 yet the square of the Table will
 the proportion.

Thus by Arithmetick.

10 to 25, so 60 to 150.

And by the Table.

in the second } to 25 } in the fifth
 Columnne } to 150 } Columnne.

in, in decimal Fractions, the Table
 very readily shew you the part propor-
 according to any value of the Inte-
 whole sum. For if you seek the value
 whole, either in the first or tenth Co-
 the 9 other Columns in that line
 the part proportional for each tenth

let the whole number be 120, finde
 this

this in the Table, and in that line you shall see, that one tenth part of it is 12; two parts are 24; 3 are 36, 4 are 48, &c.

If you finde the value in the first column then the last figure of these Numbers are to be omitted, or rather reckoned for small decimal fractions. Thus the whole being 24, 1 tenth is 2, 4, two tenths are 4, 8, three tenths, are 7, 2, &c.

This Table will be of much use in all such cases unto Artists, especially if it were extended to an 100 square every way, as it should be, and as it might be written and Printed in a sheet of large Paper: and it would be as useful a Table, or Instrument as an Artist could have.

But to give you a question of another nature, which may be of more general concernment.

Three men adventure several sums of money in one stock: the first 90/. the second 210/. the third 300/. in all 600/. and the return it brings home 1000/. what is each mans share?

Here the proportion is as 600 to 1000 which you shall finde at the latter end, of the sixth and tenth Columns, and so finding the rest of the sums in those Columns, the shares will be thus.

you have 600 } in the sixth } to 1000 } in the 10
 two 90 } Columnne } to 150 } Column.
 , &c. 210 } } to 350 }
 ft column 300 } } to 500 }

And thus you see how most questions, in
 all the parts of Arithmetick may be perfor-
 med by this Table, which with a little use
 will be familiar to you.

large Table of Accounts, for the
 ready casting up of the true value,
 of any great number of any Com-
 modities.

A Table of Accounts.

	1 farthing			2 farthings			3 farthings		
	li.	sh.	d. q.	li.	sh.	d. q.	li.	sh.	d. q.
1			I			2			
2			2			I c			I
3			3			I 2			2
4		I	0			2 0			3
5		I	I			2 2			3
6		I	2			3 0			4
7		I	3			3 2			5
8		2	0			4 0			6
9		2	I			4 2			6
10		3	2			5 c			7
20		5	0			10 c		I	3
30		7	2		I	3 c		I	10
40		10	0		I	8 c		2	6
50	I	0	2		2	2 c		3	1
60	I	0	3		2	6 c		3	9
70	I	5	2		2	II c		4	4
80	I	8	0		3	4 c		5	6
90	I	10	2		3	9 c		5	7
100	2	I	0		4	2 c		6	3
200	4	2	0		8	4 c		12	6
300	6	3	0		12	6 c		18	9
400	8	4	0		16	8 c	I	5	0
500	10	5	0	I	0	10 c	I	II	3
600	12	6	0	I	5	0 c	I	17	6
700	14	7	0	I	9	2 c	2	3	9
800	16	8	0	I	13	4 c	2	10	0
900	18	9	0	I	17	6 c	2	16	3
1000	I	0	10 0	2	I	8 c	3	2	6
2000	2	I	8 0	4	3	4 c	6	05	0
5000	5	4	2 0	10	8	4 c	15	12	6
10000	10	8	4 0	20	16	8 c	31	5	0

Number of Ells, or such like.

A Table of Accounts.

Farthing sh. d.		1 penny.			2 pence			3 pence		
		li.	sh.	d.	li.	sh.	d.	li.	sh.	d.
	1			1			2			3
	2			2			4			6
	3			3			6			9
	4			4			8	I		0
	5			5			10	I		3
	6			6			I 0	I		6
	7			7			I 2	I		9
	8			8			I 4	2		0
	9			9			I 6	2		3
	10			10			I 8	2		6
	20	I		8			3 4	5		0
	30	2		6			5 0	7		6
	40	3		4			6 8	10		0
	50	4		2			8 4	12		6
	60	5		0			10 0	15		0
	70	5	I	0			11 8	17		6
	80	6		8			13 8	I 0		0
	90	7		6			15 0	I 2		6
	100			8 4			16 8	I 5		0
	200			16 8			I 13 4	2 10		0
	300	I		5 0			2 10 0	3 15		0
	400	I	I	3 4			3 6 8	5 0		0
	500	2		I 8			4 3 4	6 5		0
	600	2	I	0 0			5 0 0	7 10		0
	700	2	I	8 4			5 16 8	8 15		0
	800	3		6 8			6 13 4	10 0		0
	900	3	I	5 0			7 10 0	11 5		0
	1000	4		3 4			8 6 8	12 10		0
	2000	8		6 8			16 13 4	25 0		0
	5000	20	I	6 8			41 13 4	62 10		0
	10000	41	I	3 4			83 6 8	125 0		0

A Table of Accounts.

	4 pence			5 pence			6 pence.		
	li.	sh.	d.	i.	sh.	d.	li.	sh.	d.
1			4			5			6
2			8			10	1	0	0
3		1	0	1		15	1	6	0
4		1	4	1		20	2	0	0
5		1	8	2	1	25	2	6	0
6		2	0	2		30	3	0	0
7		2	4	2	11	35	3	6	0
8		2	8	3	4	40	4	0	0
9		3	0	3	9	45	4	6	0
10		3	8	4	2	50	5	0	0
20		6	4	8	4	100	10	0	0
30		10	0	12	6	150	15	0	0
40		13	4	16	8	200	1	0	0
50		16	8	1	0	250	1	5	0
60	1	0	0	1	5	300	1	10	0
70	1	3	4	1	9	350	1	15	0
80	1	6	8	1	13	400	2	0	0
90	1	10	0	1	17	450	2	5	0
100	1	13	4	2	1	500	2	10	0
200	3	6	8	4	3	600	5	0	0
300	5	0	0	6	5	700	7	10	0
400	6	13	4	8	6	800	10	0	0
500	8	6	8	10	8	900	12	10	0
600	10	0	0	12	10	1000	15	0	0
700	11	13	4	14	11	1100	17	10	0
800	13	6	8	16	13	1200	20	0	0
900	15	0	0	18	15	1300	22	10	0
1000	16	13	4	20	16	1400	25	0	0
2000	33	6	8	41	13	1500	50	0	0
5000	83	6	8	104	3	1600	125	0	0
10000	166	13	4	208	6	1700	250	0	0

Number of Ells, or such like.

A Table of Accounts.

pence. h. d.		7 pence.		8 pence		9 pence.	
		li.	sh. d.	li.	sh. d.	li.	sh. d.
	1		7		8		9
	2	1	2	1	4	1	6
1	3	1	9	2	0	2	3
1	4	2	4	2	8	3	6
2	5	2	11	3	4	3	9
2	6	3	6	4	0	4	6
3	7	4	1	4	8	5	3
3	8	4	8	5	4	6	0
4	9	5	3	6	0	6	9
4	10	5	10	6	0	7	6
5	20	11	3	13	4	15	0
10	30	17	6	1	0 0	1	2 6
15	40	1	3 4	1	6 8	1	10 0
0	50	1	9 2	1	13 4	1	17 6
5	60	1	12 0	2	0 0	2	5 0
10	70	2	0 10	2	6 8	2	12 6
15	80	2	6 8	3	13 4	3	0 0
0	90	2	12 6	3	0 0	3	7 6
5	100	2	18 4	3	6 8	3	15 6
10	200	5	16 8	6	13 4	7	10 0
0	300	8	15 0	10	10 0	11	5 0
10	400	11	13 4	13	6 8	15	0 0
0	500	14	11 8	16	13 4	18	15 0
10	600	17	10 0	20	0 0	22	10 0
0	700	20	8 4	23	6 8	26	5 0
10	800	23	6 8	26	13 4	30	0 0
0	900	26	5 0	30	0 0	33	15 0
10	1000	29	3 4	33	6 8	37	10 0
0	2000	58	6 8	66	13 4	75	0 0
0	5000	145	16 8	166	13 4	187	10 0
0	10000	291	13 4	333	6 8	375	0 0

A Table of Accounts.

	10 pence			11 pence			12 pence		
	li.	sh.	d.	li.	sh.	d.	li.	sh.	d.
1			10			11			1 0
2		1	8		1	10		2	0 0
3		2	6		2	9		3	0 0
4		3	4		3	8		4	0 0
5		4	2		4	7		5	0 0
6		5	0		5	6		6	0 0
7		5	10		6	5		7	0 0
8		6	8		7	4		8	0 0
9		7	6		8	3		9	0 0
10			8 4		9	2		10	0 0
20			16 8		18	4		1	0 0 0
30	1	5	0	1	7	6		1	10 0 0
40	1	13	4	1	16	8		2	0 0 0
50	2	1	8	2	5	10		2	10 0 0
60	2	10	0	2	15	0		3	0 0 0
70	2	18	4	3	4	2		3	10 0 0
80	3	6	8	3	13	4		4	0 0 0
90	3	15	0	4	2	6		4	10 0 0
100	4	3	4	4	11	8		5	0 0 0
200	8	6	8	9	3	4		10	0 0 0
300	12	10	0	13	15	0		15	0 0 0
400	16	13	4	18	6	8		20	0 0 0
500	20	16	8	22	18	4		25	0 0 0
600	25	0	0	27	10	0		30	0 0 0
700	29	3	4	32	1	8		35	0 0 0
800	33	6	8	36	13	4		40	0 0 0
900	37	10	0	41	5	0		45	0 0 0
1000	41	13	4	45	16	8		50	0 0 0
2000	83	6	8	91	13	4		100	0 0 0
5000	208	6	8	229	3	4		250	0 0 0
10000	416	13	4	458	6	8		500	0 0 0

Number of Ells, or such like.

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A Table of Accounts.

	2 shill.	3 shill.	4 shill.	5 shill.
	li. sh.	li. sh.	li. sh.	li. sh.
1	2	3	4	5
2	4	6	8	10
3	6	9	12	15
4	8	12	16	20
5	10	15	20	25
6	12	18	24	30
7	14	21	28	35
8	16	24	32	40
9	18	27	36	45
10	20	30	40	50
20	40	60	80	100
30	60	90	120	150
40	80	120	160	200
50	100	150	200	250
60	120	180	240	300
70	140	210	280	350
80	160	240	320	400
90	180	270	360	450
100	200	300	400	500
200	400	600	800	1000
300	600	900	1200	1500
400	800	1200	1600	2000
500	1000	1500	2000	2500
600	1200	1800	2400	3000
700	1400	2100	2800	3500
800	1600	2400	3200	4000
900	1800	2700	3600	4500
1000	2000	3000	4000	5000
2000	4000	6000	8000	10000
3000	6000	9000	12000	15000
4000	8000	12000	16000	20000
5000	10000	15000	20000	25000
6000	12000	18000	24000	30000
7000	14000	21000	28000	35000
8000	16000	24000	32000	40000
9000	18000	27000	36000	45000
10000	20000	30000	40000	50000

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A Table of Accounts.

	6 shill.		7 shill.		8 shill.		9 shill.		10 shill.	
	li.	th.	li.	th.	li.	th.	li.	th.	li.	th.
1		6		7		8		9		10
2		12		14		16		18	1	00
3		18	1	1	1	4	1	7	1	10
4	1	4	1	8	1	12	1	16	2	00
5	1	10	2	15	2	0	2	5	2	10
6	1	16	2	2	2	8	2	14	3	00
7	2	2	2	9	2	6	3	3	3	10
8	2	8	3	16	3	4	3	12	4	00
9	2	14	3	3	3	12	4	1	4	10
10	3	0	3	10	4	0	4	10	5	0
20	6	0	7	0	8	0	9	00	10	0
30	9	0	10	10	12	0	13	10	15	0
40	12	0	14	0	16	0	18	00	20	0
50	15	0	17	10	20	0	22	10	25	0
60	18	0	21	0	24	0	27	00	30	0
70	21	0	24	10	28	0	31	10	35	0
80	24	0	28	0	32	0	36	00	40	0
90	27	0	31	10	36	0	40	10	45	0
100	30	0	35	0	40	0	45	0	50	0
200	60	0	70	0	80	0	90	0	100	0
300	90	0	105	0	120	0	135	0	150	0
400	120	0	140	0	160	0	180	0	200	0
500	150	0	175	0	200	0	225	0	250	0
600	180	0	210	0	240	0	270	0	300	0
700	210	0	245	0	280	0	315	0	350	0
800	240	0	280	0	320	0	360	0	400	0
900	270	0	315	0	360	0	405	0	450	0
1000	300	0	350	0	400	0	450	0	500	0
2000	600	0	700	0	800	0	900	0	1000	0
5000	1000	0	1750	0	2000	0	2250	0	2500	0
10000	3000	0	3500	0	4000	0	4500	0	5000	0

The use of this Table of Accounts.

THIS Table will serve for many uses, but that which it will be most used about, as being most necessary, is to finde out the true account of any number of Ells, Yards, or Pounds, being sold for so much the Yard, Ell, or Pound.

For Example.

What will 5000 Ells of Lockram at 11 pence the Ell come to?

To finde out this, first look to the price of the Ell, at the head of the Table, then look down the side of the Table, for the number of the Ells, so you shall finde in the last column but one in the Table, and in the last line but one thereof, that 5000 of any thing at 11 pence a piece, comes to 229^l. 3^{sh}. 4^{pence}.

Now if you cannot finde your price in one Column, or your number of things in one line, you must make two or three parts thereof, and adde them altogether; as in the Tables of Interest and Rebate before.

Thus, if you would know what 1500 Ells at nine pence half penny comes to.

First, In the Table of nine pence.

	li.	sh.	d.
1000 nine pences are	37	10	00
and 500 nine pences are	18	15	00

N 4

Then

(248)

Then in the Table of half pence,		
1000 half pence are	02	01 08
and 500 half pence are	01	00 10
	<hr/>	
In all	59	07 06
	<hr/>	

You may make this work somewhat shorter, if you divide your numbers, so that they may lie together, and so take them both together out of the Table, by adding them in one sum. As now 700 and 800 make up 1500

Then		li.	sh.	d.
700	} nine pences are	56	5	0
800				
And				
700	} half pence	3	2	6
800				
In all		59	7	6

But the Table is so plain and useful, that you will easily finde out ways of your self, to cast up any such account very certainly and suddenly thereby.

This Table also (if you have any occasion) will serve you as a Table of Interest at five *li. per Cent.* For if instead of the number of pence at the head of the Columnes, you reckon so many Moneths, then the sums underneath, will shew the true Interest due for any number of pounds set down in the side of the Table, just as before in the Table of Interest at six *per Centum*, page 71, 72, 73, 74, 75.

*A necessary Table in buying and selling any
thing by the Hundred.*

Price of one pound d. q.	Price of an hundred weight. li. sh. d.	Price of one pound. d. q.	Price of an hundred weight. li. sh. d.	Price of one pound d. q.	Price of an hundred weight. li. sh. d.
0 1	0 2 4	6 1	2 18 4	12 1	5 14 4
0 2	0 4 8	6 2	3 0 8	12 2	5 16 8
0 3	0 7 0	6 3	3 3 0	12 3	5 19 0
1 0	0 9 4	7 0	3 5 4	13 0	6 1 4
1 1	1 11 8	7 1	3 7 8	13 1	6 3 8
1 2	1 14 0	7 2	3 10 0	13 2	6 6 0
1 3	1 16 4	7 3	3 12 4	13 3	6 8 4
2 0	1 18 8	8 0	3 14 8	14 0	6 10 8
2 1	1 1 0	8 1	3 17 0	14 1	6 13 0
2 2	1 3 4	8 2	3 19 4	14 2	6 15 4
2 3	1 5 8	8 3	4 1 8	14 3	6 17 8
3 0	1 8 0	9 0	4 4 0	15 0	7 0 0
3 1	1 10 4	9 1	4 6 4	15 1	7 2 4
3 2	1 12 8	9 2	4 8 8	15 2	7 4 8
3 3	1 15 0	9 3	4 11 0	15 3	7 7 0
4 0	1 17 4	10 0	4 13 4	16 0	7 9 4
4 1	1 19 8	10 1	4 15 8	16 1	7 11 8
4 2	2 2 0	10 2	4 18 0	16 2	7 14 0
4 3	2 4 4	10 3	5 0 4	16 3	7 16 4
5 0	2 6 8	11 0	5 2 8	17 0	7 18 8
5 1	2 9 0	11 1	5 5 0	17 1	8 1 0
5 2	2 11 4	11 2	5 7 4	17 2	8 3 4
5 3	2 13 8	11 3	5 9 8	17 3	8 5 8
6 0	2 16 0	12 0	5 12 0	18 0	8 8 0

The use of this Table.

BY this Table, knowing the price of one pound of any thing, you may know how much the hundred weight (being 112 pound) comes to. Or, having bought any thing by the hundred weight, you may know how to retail it again by the pound. Thus if one pound of any thing cost four pence three farthings, a hundred weight of the same commodity will cost 2 pound, 4 shillings, and 4 pence. Also, if a hundred weight of any thing cost 4 pound, 6 shillings 4 pence, the price of one pound thereof will cost 9 pence farthing: the like may be done for any other. But if your commodity come to above 18 pence the pound, you may do it by the half of the price; or else reckon first for the shillings, and after for the rest of the price.

A Table of Expences or Wages, whereby knowing what is for one day, you may see what it is in a Week, Month, or Year.

	By the day	By the week			By the month			By the year		
		li.	sh.	d.	li.	sh.	d.	li.	sh.	d.
Pence	1	0	0	7	0	3	4	1	10	5
	2	0	1	2	0	4	8	3	0	10
	3	0	1	9	0	7	0	4	11	3
	4	0	2	4	0	9	4	6	1	8
	5	0	2	11	0	11	8	7	12	
	6	0	3	6	0	14	0	9	12	6
	7	0	4	1	0	16	4	10	12	11
	8	0	4	8	0	18	0	12	3	4
	9	0	5	3	1	1	0	13	13	9
	10	0	5	10	1	3		15	4	2
	11	0	6	5	1	5		16	14	9
Shillings	1	0	7	0	1	8	0	18	5	0
	2	0	14	0	2	16	0	36	10	0
	3	1	1	0	4	4	0	54	15	0
	4	1	0	0	5	12	0	73	0	0
	5	1	15	0	7	0	0	91	5	0
	6	2	2	0	8	8	0	109	10	0
	7	2	9	0	9	16	0	127	15	0
	8	2	16	0	11	4	0	146	0	0
	9	3	3	0	12	12	0	164	5	0
	10	3	10	0	14	0	0	182	10	0
	11	3	17	0	15	8	0	219	15	0
	12	4	4	0	16	16	0	219	0	0
	13	4	11	0	18	4	0	237	5	0
	14	4	18	0	19	12	0	255	10	0
	15	5	5	0	21	0	0	273	15	0
	16	5	12	0	22	8	0	291	0	0
	17	5	19	0	23	16	0	310	5	0
	18	6	6	0	25	4	0	328	10	0
	19	6	13	0	26	12	0	346	15	0
	20	7	0	0	28	0	0	365	0	0

In a year there are 365 dayes, and in one pound or twenty shillings there is 240 pence. So that one peny a day comes in the year to one pound, one half pound, one groat, and one peny; and thus you may reckon for any other number of pence.

As for example, six pence a day.

Is 6 pound	c6	00	00
6 half pounds, which are	03	00	00
6 Groats, which are	00	02	00
6 Pence, which are	00	00	06
<hr/>			
<i>In all</i>	09	02	06

Upon this Table you may make these and such like considerations.

A peny a day in one year comes to one *li. 10. shill. and 5. d.* Therefore in 21 years, it will come to 3 *li. 18 shill. 9. d.* This will come only by the saving thereof. But if you also employ this, so that it may gain after the rate of ten in the hundred, it will amount to above fourscore and six pounds in the said time, which may be a good portion for a mans child.

A Table of the Kings of *England*.

<i>Kings.</i>	They began to Reign.	They reign'd yea. mo. da.		
1 Wil Conq.	1066 Octo. 14	20	11	22
2 Will. Rufus	1087 Sept. 9	12	11	18
3 Henry I	1100 August 1	35	4	11
4 Stephen	1135 Decem. 2	18	11	18
5 Henry 2	1154 Oct. 25	34	9	2
6 Richard I	1189 July 6	9	9	22
7 John	1199 April 6	17	7	0
8 Henry 3	1216 Oct. 19	56	1	0
9 Edward I	1272 Nov. 16	34	3	9
10 Edward 2	1307 July 7	19	7	6
11 Edward 3	1316 Jan. 25	50	5	7
12 Richard 2	1377 June 21	22	3	14
13 Henry 4	1399 Sept. 29	13	6	3
14 Henry 5	1412 Marc. 20	9	5	24
15 Henry 6	1422 Aug. 31	38	6	16
16 Edward 4	1460 March 4	22	1	8
17 Edward 5	1483 April 9	0	2	18
18 Richard 3	1483 June 22	2	2	5
19 Henry 7	1485 Aug. 22	23	8	19
20 Henry 8	1509 April 22	37	10	2
21 Edward 6	1546 Jan. 28	6	5	19
22 Mary	1553 July 6	5	4	22
23 Elizabeth	1558 Nov. 17	44	4	15
24 James	1602 Marc. 24	22	0	8
25 Charles I	1625 Mar. 27	23	11	2
26 Charles II	1648 Jan. 30	<i>Vivat Rex.</i>		

The use of the Table of Kings.

THIS Table of the Kings I suppose may be necessary in searching out the antiquity of many old Evidences, which are dated many times by the years of the King then reigning, and not by the years of our Lord. And it might be more plain and profitable if it were drawn out a little larger, but time and paper are wanting; I have only therefore as a pattern shewn how it might be done in this hundred years last past, and added some brief notes out of History thereunto, and added one Column shewing the years which are past, to this present year, 1667.

The use of this Table will appear in such questions.

How long is it since the 25th. year of King Henry the Third?

Which is thus found,

Henry 3 began to reign, *Anno. Dom.* 1216.
To which adde the 25 years,

So is it, *Anno Dom.*

Which subtracted from the }
present year

There remains the year since

1241

1667

426

A

A brief Concordance of years with
some memorable things since the
beginning of the Reign of Queen
Elizabeth.

	A. Re.	Since.	Queen Elizabeth began Novemb. 1558.
may anti- are King of our pro- rger, have ow it last f Hi- lumn this	1558	1	109 A Parliament called
such	1559	2	108 Monasteries suppressed
King	1560	3	107 War with Scots and French
	1561	4	106 Pauls Steeple burnt
	1562	5	105 Tempest and Earthquake
	1563	6	104 20000 dye of the Plague in
	1564	7	103 Thames frozen (London
	1565	8	102 Peace with France
	1566	9	101 King James born
	1567	10	100 Royal Exchange finished
	1568	11	99 A Dry Summer
	1569	12	98 Rebellion in the North
	1570	13	97 Wars with Scotland
	1571	14	96 Earthquake in Herefordshire
16.	1572	15	95 Massacre in France
25	1573	16	94 Earl of Essex goes to Ireland
	1574	17	93 Counterfeit Spirits punished
141	1575	18	92 An Earthquake
	1576	19	91 Forbishers North Voyage
667	1577	20	90 Infection at Oxford Assizes
426	1588	21	89 A great Snow

Anno Dom.	A. Re.	Since.	Queen Elizabeth.	King Marc
1579	22	58	A curious Lock-Smith	Anno
1580	23	87	Great Earthq. & Blazing. Star	Dom.
1581	24	86	Three Jesuites Executed	
1582	25	85	New Kalendar began	1603
1583	26	84	Earthquake in <i>Dorsetshire</i>	1604
1584	27	83	<i>Nantwich</i> burnt	1605
1585	28	82	Tobacco first used in <i>England</i>	1606
1586	29	81	<i>Ludgate</i> new built	1607
1587	30	80	<i>Blackwel</i> Hall new built	1608
1588	31	79	<i>Spains</i> Armado overthrown	1609
1589	32	78	Duke of <i>Guise</i> murdered	1610
1590	33	77	Blasphemous <i>Hacket</i> hanged	1611
1591	34	76	<i>East India</i> Company began	1612
1592	35	75	The <i>Thames</i> almost dry	1613
1593	36	74	10635 die of the Pl. in <i>London</i>	1614
1594	37	73	Great Tempest	1615
1595	38	72	Scarcity of Corn	1616
1596	39	71	<i>E. Essex</i> takes <i>Cadiz</i> in <i>Spain</i>	1617
1597	40	70	Wheat 13 shillings a Bushel	1618
1598	41	69	Great Tempests and Frosts	1619
1599	42	68	Earl of <i>Essex</i> goes to <i>Ireland</i>	1620
1600	43	67	Embass. from <i>Russia</i> & <i>Barbary</i>	1621
1601	44	66	Earl of <i>Essex</i> beheaded	1622
1602	45	65	<i>Q. Eliz.</i> dies at <i>Richmond</i>	1623
				1624

King James began to Reign the 24 of
March, 1602. but one day before 1603.

King James.	Since	A. Re.	Anno Dom.
30578 die of the Pl. in London	64	1	1603
Peace with Spain	63	2	1604
Powder Treason	62	3	1605
K. of Denmark came to England	61	4	1606
Moor-fields beautified	60	5	1607
Oath of Allegiance	59	6	1608
New Exchange in the Strand	58	7	1609
King of France murdered	57	8	1610
Barthol. Legat an Arrian burnt	56	9	1611
P. Henry dies, L. Eliz. married	55	10	1612
Artillery Company revived	54	11	1613
Middletons Water	53	12	1614
Smithfield paved	52	13	1615
Charles created Prince of Wales	51	14	1616
Haidock the sleeping Preacher	50	15	1617
Sir Walter Rawleigh decollated	49	16	1618
Queen Anne dies	48	17	1619
King of Bohemia overthrown	47	18	1620
Ph. 3 K. of Spain dies, Ph. 4 suc.	46	19	1621
Prince Charles goes into Spain	45	20	1622
Black-Friers downfal	44	21	1623
Amboyna's bloody Cruelty	43	22	1624

King

King Charles began to Reign the 27 of
March, 1625.

Anno Dom.	A.Re.	Since.	King Charles I.	Anno Dom.
1625	1	42	54265 dye, of the Pl. 35417	1649
1626	2	41	War with Spain and France	1650
1627	3	40	Isle of Rhees Voyage	1651
1628	4	39	Duke of Buckingham stabb'd	1652
1629	5	38	New England planted	1653
1630	6	37	K. Charles II. born, May 29	1654
1631	7	36	Battle at Lypsick. Tilly slain	1655
1632	8	35	London Bridge burnt	1656
1633	9	34	James D. of York born, Oct. 14	1657
1634	10	33	Ship-money first taxed	1658
1635	11	32	Old Parr dyed, aged 160.	1659
1636	12	31	Dutch take Spanish silver Fleet	1660
1637	13	30	English Lyrur. sent into Scotl.	1661
1638	14	29	The Scots National Covenant	1662
1639	15	28	Dutch beat the Span. at Dover	1663
1640	16	27	The long Parl. begins, Nov. 3	1664
1641	17	26	Earl of Strafford beheaded	1665
1642	18	25	Edge hill Fight	1666
1643	19	24	Newberry first Fight	1667
1644	20	23	Newberry second Fight	
1645	21	22	Arch-B. Canterbury beheaded	
1646	22	21	Lord Fairfax takes Oxford	
1647	23	20	King taken by Parl. and Army	
1638	24	19	King traiterously beheaded	

King

27 of

K. Charles II began to Reign the 30
of January, 1648.

	Anno Dom.	A. Re.	Since	King Charles II.
35417	1649	1	18	Powder blow in Tower street
France	1650	2	17	K. Ch. II. crowned in Scotland
	1651	3	16	Worcester fight. Love beheaded
tabb'd	1652	4	15	Wars with Holland
	1653	5	14	Old and New Parl. dissolved
May 29	1654	6	13	Peace with Holland
slain	1655	7	12	Wars with Spain
	1656	8	11	2 Tides in 3 hours, Octob. 3
Off. 14	1657	9	10	Mardike taken by the E. & Fr.
	1658	10	9	Cromwel dyed (the K.
So.	1659	11	8	Sir G. Booth, and Gen. Monk for
Flee	1660	12	7	K. Charles II joyfully restored
Scotl.	1661	13	6	K. Ch. II Crowned, April 23.
enanc	1662	14	5	Married to Queen Katharine
Dover	1663	15	4	King and Queen at Windsor
Nov. 3	1664	16	3	3 Blazing-Stars seen
ded	1665	17	2	97351 dye, of the Pl. 68586
	1666	18	1	13200 houses burnt in London
	1667	19	0	The Dutch Hostile Treary

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ed
King

